

## The International Trade in Marine Shells

A Report to TRAFFIC (International)

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INTRODUCTION	1
UNWORKED SHELLS - EXPORTING COUNTRIES	5
USA	5
Philippines	6
Mexico	6
Indonesia	6
Japan	7
Haiti	7
South Korea	7
Solomon Islands	7
Australia	7
Other Countries	8
UNWORKED SHELLS - IMPORTING COUNTRIES	9
Japan	9
France	10
USA	10
South Korea	11
West Germany	11
Hong Kong	11
Spain	11
Other Countries	12
UNWORKED MOTHER-OF-PEARL	13
Pearl Shell	13
Trochidae or top shell	14
Green snail shell	15
Other species	15
WORKED SHELLS	16
Exporting Countries	16
Importing Countries	17
REVIEW OF LITERATURE AND DISCUSSION	18
Countries involved	18
Mother-of-pearl	21
Other species	27
'Rare' shells	29
Legislation	31
Conclusion	33



## LIST OF TABLES

1. Exports of Unworked Coral and shells
2. Imports of Unworked Coral and shells
3. Exports of Worked Coral and shells by weight
4. Exports of Worked Coral and shells by value
5. Imports of Worked Coral and shells by weight
6. Imports of Worked Coral and shells by value
7. Exports of unworked shells
8. Estimated exports of shells
9. US Exports of marine shells
10. US Re-exports of shells
11. Philippines - Exports of 'other shells'
12. Philippines - Exports of 'scrap shell'
- 13a. Exports of shells from Mexico
- 13b. Estimated exports of shells from Mexico
14. Indonesia - Exports of 'other shells'
- 15a. Japan - Exports of shells of shell fishes
- 15b. Japan - Exports of similar substances to coral and shells and powder and waste
16. Estimated exports from Haiti
17. Solomon Islands - Exports of 'other sea shells'
18. Australia - Exports of shells other than mother-of-pearl
19. Tanzania - Exports of corals, shell, their powder and waste
20. Kenya - Exports of corals, shells, their powder and waste
- 21a. India - Exports of marine shells
- 21b. India - Exports of other corals and shells
22. Malaysia - Domestic Exports of Coral and shells
23. Malaysia - Re-exports
24. Imports of unworked shells
25. Japan - Imports of 'other shells'
26. Japan - Imports of substances similar to coral and shells; powder and waste
27. France - Imports of unworked shells
28. US - Imports of unworked shells
29. South Korea - Imports of 'other shells'
30. West Germany - Imports of 'other shells'
31. Hong Kong - Imports of Mollusc Shell
32. Spain - Imports of 'other shells'
33. Italy - Imports of unworked coral and shells
34. Australia - Imports of coral and shells
35. Singapore - Imports of coral and shells
36. Malaysia - Imports of coral and shells
37. Kenya - Imports of coral and shells
38. Exports of unworked pearl shell
39. Indonesia - Exports of unworked mother-of-pearl
40. Philippines - Exports of unworked mother-of-pearl
41. Australia - Exports of unworked pearl shell
42. Imports of unworked pearl shell
43. Japan - Imports of Pinctada margaritifera
44. Japan - Imports of Pinctada maxima
45. US - Imports of mother-of-pearl and Trochus
46. Exports of unworked Trochus
47. Indonesia - Exports of 'troca or lola'
48. Solomon Islands - Exports of 'trocas'
49. Philippines - Exports of 'trochea' shell
50. Imports of unworked Trochus
51. Japan - Imports of 'Tectus niloticus'
52. Indonesia - Exports of 'Burgos' or Green snail
53. Solomon Islands - Exports of Green snail
54. Papua New Guinea - Exports of unworked shells

55. South Korea - Imports of Abalone Shell
56. Philippines - Exports of capiz shells
57. India - Trade in cowries and chanks
- 58a. Exports of worked mother-of-pearl by weight
- 58b. Exports of worked mother-of-pearl by value
- 59a. Imports of worked mother-of-pearl by weight
- 59b. Imports of worked mother-of-pearl by value
60. Philippines - Exports of worked shell
61. Taiwan - Exports of worked mother-of-pearl
62. South Korea - Exports of worked mother-of-pearl
63. Japan - Exports of worked mother-of-pearl
- 64a. Hong Kong - Exports of pearl buttons
- 64b. Hong Kong - Re-exports of pearl buttons
- 65a. Japan - Imports of worked mother-of-pearl
- 65b. Japan - Imports of mother-of-pearl for button making
- 66a. West Germany - Imports of worked mother-of-pearl
- 66b. UK - Imports of worked mother-of-pearl
- 66c. France - Imports of worked mother-of-pearl
- 66d. Spain - Imports of worked mother-of-pearl
- 66e. Italy - Imports of worked mother-of-pearl
67. US - Imports of articles of shells
68. US - Imports of shell or pearl buttons
69. Hong Kong - Imports of shell buttons
70. FAO statistics for catches and landings of shells



## Figures

1. US exports of marine shells 1960-1978
2. Philippine exports of 'other shells' 1970-1978
3. Japan - Imports of 'other shells' 1970-1979
4. US imports of marine shells 1960-1978
5. US Imports of Articles of shell 1961-1978

## INTRODUCTION

One of the main characteristics of the Mollusca, the second largest invertebrate phylum, is the presence in most species of a protective shell into which the animal can withdraw as a defence against predation, dessication or wave action. The shell, secreted by the mantle which is a sheet of skin covering all or part of the body, is composed mainly of calcium carbonate with a small percentage of a protein-like material called conchiolin.

Mollusc shells come in an infinite variety of colours, patterns, shapes and sculpturing, which usually reflect the life style of the species. Gastropods have a single coiled shell with a small aperture. Shells with low spires are most stable and tend to be found in species which move on the vertical surfaces of rocks and vegetation. Long spires are usually dragged along and are found in species living in soft sediments. Many species have developed spines for strengthening, protecting or stabilising the shell; others such as abalones and limpets have become secondarily straightened out and can be clamped tightly to wave-swept rocks. Bivalves have a shell in two parts which fit together tightly to enclose the animal completely. Their shape is less variable than gastropod shells, although burrowing forms tend to have very stream-lined shells.

Many shells have an inner layer of nacre or mother-of-pearl which is made up of tiny blocks of crystalline calcium carbonate arranged in layers. Pearls are formed when sand grains or other particles get lodged between the mantle and the shell, and concentric layers of nacre build up around them. Although pearls can be produced by many species, only certain molluscs



produce commercially valuable ones, such as Pinctada margaritifera and P. mertensi.

Prehistoric man discovered that the soft parts of molluscs provided an easily accessible, nutritive source of food, and since then this group of animals has been exploited heavily. The shell part also gradually came to be valued for a number of reasons, not least of which was its beauty. Shells have been used by many races and cultures as holy objects, currency, jewelry and to decorate clothing and household articles. Calcined shells make the finest lime which is used for pottery glazes and betel chewing, and also for toothpaste and poultry food. Dead shells washed ashore in large quantities or dredged if they occur in large banks may be used for these purposes and include oysters, Meretrix, Arca, Vellorita, Katelsia (Durve, 1975: Saul, 1974). Building blocks are made from crushed shells and coral, bound together with cement, and where large quantities of empty shells can be dredged they are used in road-making. A detailed history of man's use of shells is provided by Saul (1974).

This report however is concerned mainly with the extensive and escalating trade in tropical shells which are sold as curios and souvenirs to decorate homes, shops, <sup>and</sup> restaurants, for jewelry and for other ornamental articles. These come mainly from tropical coral reefs, now recognised as among the most highly productive marine ecosystems. The large scale commercial collection of shells in many areas has led to fears that populations may be being depleted and coral reefs damaged during collection.

Unfortunately foreign trade statistics do not record



tropical shells for the curio trade under a separate tariff heading from those which are dredged or mined for industrial uses. They also do not separate shells collected from the wild from those obtained from shell fish culturing enterprises or from molluscs collected from food. The statistics used in this report are taken from two tariff headings: unworked or raw coral and shells [(05.12 BTN (Brussels Tariff Nomenclature); 291.15 SITC (Standard International Trade Classification)] and worked or carved coral and shells (95.05 BTN; 899.11 SITC). Some countries lump coral and shells together in each section under one tariff heading; other countries separate them under different tariff headings and in the unworked section may have a further heading for "powder and waste of coral and shells; and similar substances". A few countries break their statistics down according to different species or types of shell; for example mother-of-pearl is often recorded separately under the BTN heading 95.02.

In view of the problem of shells not always being recorded separately in trade statistics, an overview of world trade in both corals and shells is given in the following paragraphs. The rest of this report is concerned with the shell trade only, and the coral trade is analysed and discussed in Wells (1980).

Tables 1-6 list all the countries which according to foreign trade statistics were involved in the international coral and shell trade between 1976 and 1978. In these tables figures for corals and shells have been added together for the countries where they were recorded under separate tariff headings. In Table 1



the export figure given by a country was used where this could be obtained; for countries where statistics were not available exports were estimated from figures produced by importing countries. Tables 2-6 list only those countries recording their own imports and exports.

Denmark and the Netherlands recorded the highest exports of unworked coral and shells. These were probably mainly shells for industrial uses, dredged in the North and Baltic Seas, and will not therefore be discussed further in this report. The Philippines and the US were the second major exporters; many of their exports include shells and corals from tropical reefs. Other major exporters include Indonesia, Malaysia, Mexico, Haiti, Australia and a number of Pacific islands. Apart from the European countries, the major exporting countries are in the tropics.

The main importers of unworked coral and shells are the northern European countries, Singapore, Japan, South Korea and the US. Imports into Europe and Singapore are probably mainly shells for industrial purposes (the bulk of Singapore's imports come from Malaysia (Table 35)).

Trade figures for worked coral and shells can be misleading as the items recorded under these tariff headings may include other materials such as wood, metal etc. However it is clear that the Philippines is the major exporter, in terms of both weight and value, followed by Taiwan. Exports from Italy have a high value; this country is traditionally the centre of the cameo and coral carving industry. Japan, West Germany and Thailand are also major exporters of worked coral and shells. The main importers are W. Germany, the US, Japan, Spain and Italy.



Prices of shells are very variable and are not discussed in this report. Abbott(1980) reviews current trends.

#### UNWORKED SHELLS-EXPORTING COUNTRIES

Countries recording exports of shells are given in Table 7 with a breakdown according to species. Table 8 gives the 'estimated' exports from all countries involved, calculated from figures produced by importing countries, and including all types of shell. This latter table shows that the Netherlands and Denmark are the main exporters (see p.4 ), and are followed by the US, the Philippines Mexico and Indonesia, which are discussed below in more detail.

#### USA

Exports of shells from the US increased rapidly in the 1960s reaching a peak in 1966 (Table 9 and Fig. 1). Subsequently exports dropped, averaging about 5,000 tonnes between 1970 and 1978. Between 1960 and 1967 over 50% of exports went to Japan and a large proportion continues to do so; (these are probably freshwater mussels (Abbott,1980) although since 1965 the tariff heading has specified marine shells). Large quantities also went to Canada. Since 1970 exports to South Korea have been increasing; these are probably mainly abalone shells (see p. 14). The US records re-exports of small quantities of marine shells (Table 10), and since 1971 an increasing number have been destined for South Korea. According to Abbott(1980) the US re-exports Haitian shells, especially conches, to the Bahamas. The Bahamas recorded imports of 3 555 conch shells from the US in 1976 and 710 in 1977 (Table 24).



### The Philippines

Philippine exports of pearl shells and trochus are discussed later in the section on mother-of-pearl. The main shell exports from the Philippines are recorded under the tariff heading 'other shells' (Table 7) which covers species destined for the curio trade. From 1970 to 1973 exports rose rapidly to a peak (Table 11 and Figure 2) and they have remained fairly high since then. Between 1974 and 1978 the average annual export was 3 451 tonnes. Just under 50% went to the US; about 600 tonnes were exported to Japan annually, and other important countries of destination were Hawai'i, Italy, Spain, the UK, the Netherlands and Hong Kong. A small but variable quantity of scrap shell was exported, most of which went to Taiwan and the US. In 1978 exports were considerably higher than in previous years (Table 12).

### Mexico

Shells from Mexico are probably used mainly by the curio trade since they are recorded by importing countries under the category 'other shells'. Actual recorded exports are slightly lower than estimated exports, and were destined mainly for Japan and the US in 1976. (Table 13a). Imports from Mexico into South Korea, Japan and the US increased between 1976 and 1978 (Table 13b).

### Indonesia

Most of Indonesia's shell exports are of mother-of-pearl and are discussed later. Exports of 'other shells' reached a peak in 1973 but have declined since then (Table 14). They were destined mainly for Japan, Singapore and Hong Kong.

### Japan

Exports of 'shells of shell-fishes' probably includes the shells of cultured pearl oysters. Exports increased six-fold between 1976 and 1979 (Table 15a), the biggest increase being in exports to South Korea. Exports to the US declined. Japan also exported powder and waste of shells and coral to a number of countries including Taiwan, W. Germany, the US and the Netherlands (Table 15b).

### Haiti

Between 1976 and 1978 imports from Haiti were recorded by the US, Japan, Spain and Taiwan (Table 16). They were recorded under the tariff heading for 'other shells', and so were probably destined for the curio trade. Estimated annual exports averaged 925 tonnes.

### South Korea

Most of South Korea's exports of shells are oysters and are discussed in the mother-of-pearl section. Exports of 'other shells' were recorded in 1977 and 1978 (Table 7), and went to Japan, with a small quantity to Hong Kong (7 300 kg) in 1977. Powder and waste of shell was also destined for Japan (Table 7).

### Solomon Islands

Most exports were for the mother-of-pearl trade. A small quantity of 'other shells' was exported between 1976 and 1978 (Table 17).

### Australia

Exports of shells other than mother-of-pearl were destined mainly for Hong Kong and South Korea (Table 18).



### Other Countries

It has not been possible to carry out detailed analyses for each country.

A number of countries are known to be important exporters of shells but trade statistics do not separate shells from corals, e.g. Kenya, Tanzania, India and Singapore. Between 1974 and 1978 Tanzania recorded higher exports of coral and shells than Kenya (Tables 19 and 20), and most were destined for the US, Europe (especially the UK and Italy) and Japan. Kenya's exports were also destined mainly for the US, Italy and the UK. In 1978 exports from Kenya were the highest since 1974; this may have been in anticipation of the ban on shell exports in 1979 (see discussion). Japan recorded imports of 'other shells' from both countries, imports from Tanzania being higher than those from Kenya (Table 25). The US recorded more imports from Tanzania in the early 1970s but between 1976 and 1978 recorded more from Kenya (Table 28). No countries recorded imports of mother-of-pearl from East Africa.

Indian exports of cowries and chanks (Turbinella pyrum) are described later. Indian exports of marine shells have increased since the beginning of the 1970s and by 1979 reached almost 500 tonnes (Table 21a). Exports to the US increased noticeably, from 40kg in 1969 to nearly 105 tonnes in 1979. Other countries of destination were Hong Kong, Japan and Europe and in 1979 large quantities went to Oman, Bahrein and Kuwait. Foreign trade statistics record exports under the heading 'other corals and shells'. Most were destined for the USA and Europe, and in 1977 large quantities went to Nepal as well (Table 21b). A number of countries recorded imports of shells from India; for example in 1978 Japan

imported Tectus niloticus, Pinctada maxima and other shells from India; South Korea and the US imported shells; and Spain imported mother-of-pearl.

Malaysia recorded huge domestic exports of coral and shells to Singapore (Table 22) and smaller quantities to other countries. The former were probably for building or industrial purposes. Malaysia also re-exports corals and shells (Table 23).

#### UNWORKED SHELLS-IMPORTING COUNTRIES

Countries recording imports of shells are shown in Table 24. Other major importers are Canada, Italy, the Netherlands, Belgium, Australia and other European countries (see Tables 9 and 11). A number of countries increased their imports of shells between 1976 and 1978 (see below).

#### Japan

Japanese imports of mother-of-pearl are discussed in the next section. Over three quarters of imports of shells into Japan come under the heading 'other shells' (Table 24), and imports increased nearly two-fold between 1970 and 1979 (Table 25 and Fig. 3). Over 50% came from the US and were presumably freshwater pearly mussels (see p.25). South Korea became an increasingly important supplier throughout the 1970s. Imports from Mexico also increased up to 1978 but in 1979 were half those of previous years. Other major suppliers were the Philippines, Indonesia,



Taiwan and Haiti.

Japan also records imports under the tariff heading 'substances similar to coral and shells; and powder and waste of shells'. These came mainly from the Philippines, South Korea and Taiwan (Table 26) and averaged 402 tonnes a year between 1970 and 1979.

### France

French imports came mainly from the Netherlands and Denmark (see p. 4), Turkey and other European countries. In 1976 and 1978 nearly 100 tonnes came from Madagascar (Table 27).

### USA

Imports into the US have increased noticeably since the 1960s when average annual imports were 1 483 tonnes (Table 28, Fig 4). The biggest increase has been in imports from Mexico, which became the major supplier in 1977 and 1978, having usually supplied less than 100 tonnes a year in the 1960s. The Philippines was the main source between 1970 and 1976, imports from this country also having increased since the 1960s. Haiti is now the third major supplier; imports from this country increased rapidly at the end of the 1960s but decreased between 1977 and 1978. In the 1960s there were major imports from the Bahamas and Jamaica (Table 28), but although a detailed breakdown of countries of origin is not available for the years 1974-1977, there is evidence that imports from these countries have declined. In 1978 only 3 tonnes came from the Bahamas compared with an annual average of 25 tonnes between 1970 and 1973. Imports from Jamaica totalled 12 tonnes in 1973 compared with an annual average of 323 tonnes between 1960 and 1964.

Imports from Australia have decreased slightly since the

1960s. Imports from Japan have also decreased; these figures parallel the decrease in exports to the US recorded in Japan's trade statistics (Table 15) (although the actual quantities do not agree). No imports were recorded from Taiwan until 1968 but in 1978 this country was the fourth major supplier; highest imports from Taiwan were in 1976. East Africa (i.e. Kenya and Tanzania) was an important supplier most years. Since 1964 imports from the two countries have been recorded separately. Until 1971 higher exports were recorded from Tanzania than from Kenya, but between 1976 and 1978 imports from Kenya were higher.

#### South Korea

South Korea's imports of oyster, pearl and abalone shell are discussed in the following section. In 1977 and 1978 large quantities of 'other shells' were also recorded (Table 24). Over 90% of these came from Japan, with smaller amounts from Indonesia, the Philippines, India, the US and other countries (Table 29).

#### West Germany

West Germany imported large quantities of 'other shells' in 1976 and 1977. Most came from Denmark and the Netherlands (Table 30, see p.4 ).

#### Hong Kong

Imports into Hong Kong increased between 1976 and 1978, the main increase being in imports from Australia (Table 31).

#### Spain

70% of Spanish shell imports came from the Philippines



(Table 32) and 10% from Haiti. Italy, Madagascar and the US were also regular suppliers.

### Other Countries

A number of countries which do not separate coral and shells in their foreign trade statistics are also major importers.

Italy imports from a very large number of countries; a detailed breakdown of countries of origin is available for 1976 (Table 33). A large proportion came from Denmark but the main suppliers of tropical corals and shells were Indonesia, the Philippines, the Sudan, the US, Malaysia, Haiti, Australia and New Caledonia. Many of these imports were probably mother-of-pearl and helmet shells or conches for the carving and cameo industry. The US, the Philippines, Indonesia and Australia all recorded exports of shells to Italy (see Tables 9, 11, 14 and 18).

Australian imports of coral and shells increased between 1976 and 1978, and about 50% came from the Philippines. Japan, Taiwan, Mexico and the US were also major suppliers, and in 1978, Haiti and the Solomon Islands as well. (Table 34). The Philippines and the Solomon Islands recorded exports of 'other sea shells' to Australia, and Japan recorded exports of 'shells of shell fishes'.

Singapore imported large quantities of coral and shells from Malaysia (Table 35 and see p.4), and imports also came from the Philippines, New Caledonia, Papua New Guinea and a number of other countries.

Malysian imports came mainly from Taiwan, the Philippines and Singapore (Table 36). Kenyan imports of coral and shells fluctuated between 1974 and 1978, but came regularly from Somalia. In 1977 and 1978 imports also came from Tanzania (Table 37).

## UNWORKED MOTHER-OF-PEARL

Some countries record all types of mother-of-pearl shell under a single heading; others separate 'pearl shell' (i.e. pearl oyster shells) from green snail shells and trochus or top shells (Table 7).

### Pearl Shell (Pinctada)

Although this section refers mainly to pearl oyster shells the figures given may include green snail shell and trochus as from some countries it is not known exactly which species are recorded under the tariff heading 'pearl shell'. Between 1976 and 1978 the main exporters were Indonesia, Australia and the Philippines (Table 38). Exports from Indonesia increased markedly between 1970 and 1978 (Table 39), and were destined largely for Japan, Singapore, Hong Kong and South Korea. Exports from the Philippines fluctuated and went mainly to Japan and South Korea (Table 40). Exports from Australia were destined for the US and Europe (Table 41).

The main importers of pearl shell between 1976 and 1978 were Spain, Japan, South Korea and West Germany (Table 42). Many more countries are probably involved but their trade is recorded under the general heading of coral and shells. Japan gives details of imports for two particular species, Pinctada margaritifera and P. maxima. Japanese imports of P. margaritifera came mainly from the Philippines and Indonesia and smaller quantities have come regularly from the Solomon Islands, Papua New Guinea, Fiji and



more recently the Cook Islands (Table 43). Imports of P. maxima have also come mainly from the Philippines and Indonesia, although at the beginning of the 1970s comparatively small quantities were coming from the latter. Australia and Burma have supplied this species to Japan regularly and Papua New Guinea was another important source up until 1973 (Table 44).

Until 1963, the US recorded imports of mother-of-pearl and trochus under a separate tariff heading from other shells. Between 1960 and 1963 most imports came from Australia (c. 60%), and from Japan (20-30%) (Table 45). Since 1963 these imports have been included in 'marine shells'.

#### Trochus or top shell (Tectus niloticus and Trochidae)

The main exporters of Trochidae shells are Indonesia, Papua New Guinea, the Philippines and a number of the small South Pacific islands: viz Solomon Islands, Marshall, Mariana, and Caroline Islands, Fiji, New Caledonia, New Hebrides. (Table 46).

90% of all Indonesian shell exports are Trochidae, over 1 000 tonnes being exported annually (Table 47). Exports have fluctuated but slightly fewer were being exported annually at the end of the 1970s than at the beginning, mainly due to a decline in exports to European countries. Exports went mainly to Japan and Singapore in 1978.

Exports from the Solomon Islands were destined mainly for Japan; exports decreased between 1976 and 1978 (Table 48). Philippine exports of Trochidae decreased between 1970 and 1978; most were sent to Japan (Table 49).

The main importers of Trochus are Japan and Singapore (Table 50). Japanese imports come mainly from Indonesia and the South Pacific islands (Table 51).

Green snail shell (Turbo marmoratus)

This species is recorded separately only by Indonesia, the Solomon Islands and Papua New Guinea. Exports went mainly to Japan, Hong Kong, Singapore and West Germany (Tables 52, 53 and 54).

UNWORKED SHELLS-OTHER SPECIES .

S.Korea records imports of abalone shells. Imports increased from just over 1 000 tonnes in 1976 to nearly 2 000 tonnes in 1978, and 50% came from Mexico. Other major suppliers were the US, Australia and Japan (Table 55).

The Philippines recorded exports of Placuna placenta, the window pane oyster or capiz shell until 1972. Between 1970 and 1972 exports decreased drastically (Table 56).

India recorded trade in cowries and chanks (Turbinella pyrum) in 1976 and 1977 (Tables 57). Cowries were imported from the Maldives and were exported (domestic exports) to the US. Exports of chanks were lower in 1977 than in 1976; they were destined for Italy and other European countries and in 1977, for the US.

The Bahamas recorded imports and exports of conches in 1976 and 1977. In 1976, 3 535 conch shells were imported from the



US and in 1977, 710. Exports were not recorded in 1976 but in 1977 13 575 were exported of which 11 180 went to Italy and 2 395 to the US (Bahamas Foreign Trade Statistics).

### WORKED SHELLS

The only worked shell recorded regularly in trade statistics is mother-of-pearl. Quantities recorded under the tariff heading for worked materials include other materials which may be part of the items concerned and so the weights give only a rough estimate of the actual quantities involved.

The main exporters of worked mother-of-pearl are the Philippines, Taiwan, South Korea, Japan and Thailand (Tables 58 a and b). The Far East has traditionally been the centre of the carving industry for a number of wildlife products including coral, shells, ivory and tortoiseshell. In Europe, Italy and West Germany are the only countries which record substantial exports; Italy is famous for its carved cameos and corals.

Trade statistics show the main importers of worked shell, including articles made of shell, to be the US, Japan and Europe particularly France, West Germany, Spain, Italy and the UK. (Tables 59 a and b).

Mainland China is also an important exporter; a number of countries imported from there, and estimated exports for Mainland China in 1976 were 20 517 kg.

### Exporting Countries

The Philippines record worked shell and articles made

of shell under a number of headings which include handbags, lampshades, buttons, capiz shell, mother-of-pearl and 'other shells' (Table 60). The main destinations <sup>between 1976 and 1978</sup> were the US, Hawaii, Japan, Australia and Europe but exports went to many other countries as well. Taiwan also exported a variety of types of worked mother-of-pearl (Table 61) which went to many countries.

Exports from South Korea went mainly to Japan and the US, although exports to these two countries decreased between 1976 and 1978; exports to Hong Kong and Middle Eastern countries increased however (Table 62). Japanese exports increased between 1976 and 1978 and went mainly to Spain and the US (Table 63). Exports from Thailand also increased (Table 58a). Hong Kong recorded exports and re-exports of pearl buttons; both increased rapidly between 1976 and 1978 particularly to Australia and Taiwan (Table 64 a and b).

### Importing countries

Most Japanese imports of worked mother-of-pearl came from South Korea, the Philippines and Mainland China (Table 65a). Large quantities of mother-of-pearl for buttons were imported from South Korea (Table 65b). Imports into France, West Germany and the UK of worked mother-of-pearl came primarily from the Philippines (Table 66 a, b and c). Spanish and Italian imports came from a number of countries of which Japan was the main source (Tables 66d and e).

US imports of worked shell were recorded under two tariff headings: "Cut cameos and coral for jewelry" and "Articles of shell". Imports of the former increased dramatically in the 1970s and are discussed in Wells (1980). Values of annual imports



of articles made from shells also increased rapidly between 1972 and 1976, mainly as a result of increased imports from the Philippines, which is the major supplier (Table 67 and Fig. 5). The US imports shell or pearl buttons but statistics were only obtained for 1969 and 1975; in 1969 the Philippines was the main supplier and in 1975, Japan (Table 68).

Imports of shell buttons into Hong Kong increased three-fold between 1976 and 1978. Over 75% came from Japan (Table 69).

## REVIEW OF LITERATURE AND DISCUSSION

### Countries involved

The trade statistics analysed in the preceding sections suggest that the demand for tropical sea shells and articles made from them increased throughout the 1970s. The US and Japan, the two major consumers of ornamental shells have shown marked increases in imports of unworked shells, as has South Korea. The US in particular has shown a huge increase in imports of worked shell. The extent to which these statistics refer to ornamental tropical shells can be gauged from information available on the retail and wholesale end of the trade.

Abbott (1980) carried out a detailed analysis of the shell trade in Florida, which has a greater number of shell dealers than any other state in the US. He found that 85% of the wholesalers obtained their shells in bulk from overseas, and according to the dealers, the main countries of origin (in descending order of importance) are the Philippines, Mexico, Haiti, India, Taiwan,

Japan and East Africa, with fewest coming from domestic waters and other countries. The trade statistics confirm this (ignoring European sources which almost certainly provide shells for industrial purposes).

Abbott identified some 300 species on sale in Florida, with another 4 700 species likely to appear from time to time. The most popular selling species are: the Pink Conch (Strombus gigas), the tiger cowrie (Cypraea tigris), the Pink Mexican murex (Phyllonotus erythrostomus), the Chambered Nautilus (Nautilus pompilius), scallops, large clam shells (Hippopus and Tridacna) and large showy gastropods such as Voluta, Tonna, Syrinx and Pleuroploca. Other studies (e.g. Evans et al., 1977) have also shown that the most popular species are the large colourful ones found on tropical reefs, which explains the major trade which has developed with tropical countries such as the Philippines, Mexico and Haiti.

Mexico has recently become one of the main suppliers of shells, especially for the US, Japan and South Korea. FAO statistics show that it was a major producer of shells other than mother-of-pearl between 1974 and 1977 (Table 70c). (FAO statistics are included for comparison but their figures clearly do not include all the countries involved in shell exploitation). It was also shown to have exported large numbers of abalone shells to South Korea (see Table 55), which may be a by-product of the abalone meat industry. There is little information on the areas in Mexico where shells are collected, but the increase in exports may be due to stepped up off-shore fishing for Murex, Oliva, Strombus and abalone (Abbott, 1980).



In the mid 1970s the Philippines was easily the major supplier and it is still one of the main exporters. Philippine collectors tend to collect anything and sell in bulk without discriminating between species (Webster, 1977 in litt.). Haiti's large export trade is due to organised wholesalers on La Gonave island, where labour is cheap; the meat is used for food (Abbott, 1980).

There is clear evidence that exports of shells from India are increasing rapidly. Recently some of its off-shore beds have been exploited for the first time (Abbott, 1980). Large specimens of ornamental shells were being collected round Rameshwaram and the Andaman and Nicobar islands at the beginning of the 1970s (Durve, 1975). Currently large quantities are being collected along the south Indian coast, especially off Tuticorin, south of Madras and Rameshwaran. Nearly two dozen species are involved and they are exported through Bombay, (Kannan 1980 in litt.).

There is little information on the export trade from East Africa although both trade statistics and FAO figures confirm that Kenya and Tanzania are important producers. Studies on the souvenir shell trade within Kenya showed that the main collecting areas are now the more inaccessible areas on the north and south coasts, such as Lamu and Shimoni; popular species are relatively rare near the tourist resorts, probably as a result of over-collecting. At least one firm is known to export shells from Mombasa, (the Naushad Trading Co). including Cassis rufa destined for the cameo industry in Italy (Evans et al., 1974; Wells, 1978).

Ornamental shells are generally sold in seaside curio and

and souvenir shops, which in the past probably sold souvenirs decorated with local shells. In many places however, colourful local species may now be hard to find, especially in tourist resorts bordered by coral reefs such as Florida, Hawaii and the Caribbean islands, and because of their relative rarity<sup>key</sup>, may also be more expensive than exotic shells imported in bulk. In Hawaii, where tourism has increased rapidly since 1972, nearly 60% of several hundred shops in Lahaina on Maui had some trade in molluscs in 1977, most of which were imported from all over the Indo-Pacific, especially from the Philippines and India (Mills, 1977). The Philippines exported over 115 tonnes of shells to Hawaii in 1978 (Table 11). The largest wholesale enterprise for shells in Hawaii in 1976 was 'Exotic Shells' and most of their stock was imported from countries including Taiwan and Mauritius. Shells were imported by the crate load in such quantities that the owner, Bremont, had little idea of the size of his stock or the species involved at any one time (Taylor, 1976).

In the UK in 1977, Leslie Sarogny-Frye was importing 10 tonnes of assorted corals and shells from the Philippines every two months, his main sales being to hotels and sea side gift shops (Anon, 1977). In 1978 Barry Lonsdale of Tropical Sea Shells in Rochdale in the UK was selling about 3 tonnes of shells a week, imported from the Philippines, East Africa and the Seychelles (Anon, 1978).

#### Mother-of-Pearl

Mother-of-pearl is one of the few types of shell for which fairly detailed trade statistics are available. Four species are commonly fished for their nacre, and provide the best mother-of-pearl.



<u>Pinctada margaritifera</u>	Black-lip pearl shell
<u>Pinctada maxima</u>	Gold-lip pearl shell
<u>Tectus niloticus</u>	Trochus or top shell
<u>Turbo marmoratus</u>	Green snail or turban shell

A number of other Pinctada species, abalone shells, chanks and freshwater mussels are also used. Mother-of pearl has been used for centuries for decorative inlay work, buttons and jewelry as it is hard and can be cut precisely and polished to a rich sheen. The pearl button industry reached a peak in the late 19th century when the UK alone imported at least 2 000 tons of pearl shell a year (Saul, 1974). Pearl buttons have to be made by hand and with the escalation of labour costs in Europe and the US, and the development of the plastics industry the trade declined (Saul, 1974: Travis, 1959). There now appears to be a revival of interest in mother-of-pearl as a fashionable material for buttons and jewelry, probably as part of the general trend away from plastics and the return to the use of natural products in the developed countries; the tortoiseshell trade has undergone a similar revival (Mack, Duplaix and Wells, 1980). Export statistics show that most manufactured articles come from the Far East where labour is still cheap.

Pinctada margaritifera, which purportedly produces the world's finest pearls, was formerly not in demand for its nacre (Major, 1974). Japan now imports large quantities of this species from the Philippines and Indonesia. In 1931 it was common and widely distributed in the Sulu Archipelago, and the Philippines exported about 20 000 kg of shell a year (Talavera, 1931); in 1979 Japan imported 209 805 kg a year -(Table 30a.)

P. maxima has always been in demand for its shell, particularly for the button industry. Japanese imports in 1979 were coming mainly from the Philippines and Indonesia although Australia used to be a major supplier. In 1931 this species was reported to be very abundant in the Philippines and almost the whole of the Sulu Archipelago was said to be one extensive pearling bank, 35 000 km<sup>2</sup>. The growth rate of this species is rapid, it is sexually mature in two years, and most valuable when 3-4 years old and so it may be able to support a fairly large take. The Philippines exported just over 200 000 kg a year in 1927 and 1928 to the US, Europe, Hong Kong, Japan and the British East Indies (Talavera, 1931). In 1979 Japan imported 169 046 kg of this species from the Philippines.

FAO records catches and landings of Pinctada spp. (Table 70a). Between 1974 and 1977, highest catches were recorded for Australia. Japan and Fiji were also recorded but not the Philippines or Indonesia.

Traditionally there has been an extensive pearl oyster fishery in the Red Sea (Harrison Matthews, 1975). Few countries have recently recorded imports specifically of unworked pearl shell from this area (39 000 kg were imported from the Sudan in 1978 by Spain ), but the Sudan, Somalia, Saudi Arabia and North and South Yemen are known to be involved in the coral and shell trade (see Table 1). Between 1960 and 1963 the US regularly imported pearl shells from Aden and Arabia (Table 45).

Tectus niloticus is the largest of the top shells

and is most in demand for its mother-of-pearl although other top shells such as T. maximus may also be used (Talavera 1931, Saul 1974). The main exporters of Tectus<sup>(Tectus)</sup> appear to be Indonesia and the South Pacific islands (Table 46), (according to FAO statistics highest catches are obtained in the Solomon Islands and Fiji (Table 70 b)). According to Dance (1976) the principal Tectus<sup>(Tectus)</sup> beds are off the coasts of New Caledonia and Queensland and amongst the Andaman and Nicobar Islands. The trade statistics suggest that exports from Indonesia, the Philippines and the Solomon Islands are declining. Unlike pearl oysters, this species never occurs in large numbers over a limited area, but is usually found scattered singly near the outer edge of coral reefs.

Over fishing of this species has been recorded a number of times as the following figures giving the tonnage fished legally may indicate (Dance, 1976).

<u>Queensland</u>		<u>New Caledonia</u>		<u>Andamans and Nicobar</u>	
1916	1 048	1913	1 004	1930	450
1922	265	1930	180	1935	50

(figures in tons)

According to Dance (op. cit), approximately 4 000 specimens comprise a ton and it takes more than 3 years to grow to a marketable size. Dance believed that had the plastics industry not replaced the need for this species it would have been on the verge of extinction.

In Papua New Guinea legislation had to be introduced to control fishing for Tectus niloticus. At the beginning of this century production dropped substantially from 1 000 tonnes in 1913 to 358 tonnes in 1928. During the Second World War, fishing stopped and the stocks had a chance to recuperate. 800



tonnes were taken in 1954 when fishing was resumed, but by 1956 the catch had already decreased to 402 tonnes. A moratorium was introduced for a year and since then commercial fishing has been permitted, provided a minimum size limit of 10 cm. diameter is adhered to and fishing zones are rotated (Barletta, 1976). In 1978 Papua New Guinea was about the fourth largest exporter of Tectus. In 1927 and 1928, the Philippines exported about 100 000 kg annually to China, Japan and the British East Indies; in 1978 the Philippines exported nearly 127 000 kg mainly to Japan, Spain and Italy (see Table 49). It is not clear what controls exist currently in this and other exporting countries to prevent over exploitation.

Green snail shells Turbo marmoratus were once used as festive drinking cups in Scandinavian countries, and they have also been used for buttons and other decorations. The surface can be treated and polished to reveal a greenish pearly nacre (Saul, 1974). This species is found at greater depths than other pearl shells, on the edges of reefs and it is usually collected by skin divers. Currently the Solomon Islands and Papua New Guinea are the major suppliers. In 1931 the Philippines exported 11 666 kg (Talavera, 1931) and in 1930 it was being fished off the Seychelles and Chagos (Travis, 1959). FAO recorded production of 400 tonnes a year between 1974 and 1977 in Sabah.

The mother-of-pearl trade is subject to the influence of trade in mother-of-pearl from fresh water molluscs (Unionidae) which in the US have provided a major source of mother-of-pearl since the last century. Pearl buttons began to be manufactured from them on a commercial scale in 1891, but by early this century depletion of the mussel beds was apparent, and

production declined. During and after the Second World War many of the commercial beds underwent a mild recovery as a result of the low level of exploitation along with attempts to clean up the rivers and decrease pollution.

In the 1950s the Japanese turned to North America for supplies of freshwater mussels as these are crushed and used to seed cultured pearl oysters. Previously they had been able to obtain supplies from the Yangtse River in China. Since the export trade with Japan has been opened up, North American rivers have been successively depleted as boats move on to new ones having exhausted others. In 1971 it was stated that it seemed unlikely that the industry could continue for another decade at the same rate of exploitation (Stansbery, 1971), and a symposium on rare and endangered molluscs in the US recommended that trade should be restricted to licensed collectors (Jorgensen and Sharp, 1971). However, according to FAO statistics an average of 1 436 tonnes were caught annually between 1974 and 1977. Trade statistics show that exports of shells to Japan from the US are still high, although lower than in the 1960s. A number of the rare Unionidae species are now listed on the US Endangered Species Act and are on Appendix I&II of CITES (the Convention on International Trade in Endangered Species of Fauna and Flora). Clamming is forbidden in some areas to allow stocks to build up and some species are protected by state as well as federal laws (Fitzpatrick, 1963) but detailed up to date information on current legislation has not been obtained.

### Other species

Capiz shell or the window pane oyster (Placuna placenta) has been used in the Far East, especially in China, for many years as glass for windows, as its valves are thin and translucent. In the Philippines they have been used for the same purpose during the past 100 years. The pearls produced by this species are small and soft and are used only for medicinal purposes. The shells are found in large beds which may yield substantial crops regularly. They are collected by wading and many of the shells taken are in fact dead. They need a muddy or sandy substrate and are most successful in shallow water, although they may occur as deep as 40 m.

In 1931 the shells were still used in Philippine houses, but were increasingly used for shell crafts which is their main use now. Artificial cultivation was being successfully carried out in 1931, in combination with oyster farming, and since only large shells were of real value it was thought that wild populations were unlikely to be fished out. Manufactured articles were exported to Europe, China, the US, Hong Kong and the British and Dutch East Indies, and it was presumed that the export trade would continue. Raw shells were also exported in small quantities to the US and Hong Kong: 552 kg in 1927, 612 kg in 1928 and exports increased three-fold in 1929 (Talavera, 1931).

At the beginning of the 1970s unworked capiz shell was still being exported from the Philippines but there was a big drop in exports in 1972 and subsequently exports were not recorded.



An apparently unknown ecological disaster may have caused the failure of the beds (Kline, 1977). Worked capiz shells are still exported in large quantities however, and capiz shell articles from the Philippines can be seen in gift shops and department stores in the UK used in lampshades, boxes and aolian harps (pers. obs). A sizeable fishery for capiz shells existed in India along the Bombay and Goa coasts (Durve, 1975).

India recorded exports of cowries (Cypraea) and chanks (Turbinella pyrum) under separate tariff headings. An average tiger cowry (C. tigris), which is one of the most popular species, probably weighs no more than 100 gms; Indian exports in 1977 therefore represented well over 45 million specimens, and probably many more as other species such as the tiny ring and money cowries (C. moneta and C. annulus) were probably included in these export figures. A dealer in the UK supplied three quarters of a million cowries to a firm in 1977 which was marketing a game which required cowries, (Anon, 1977). Cowries are now frequently carved, or sliced and turned into napkin rings, or used in jewelry; money cowry necklaces are sold in most major cities of the world.

The Sacred Chank has a special holy significance in India and has been collected for centuries for use as trumpets and libation vessels in temples, and they are also used for buttons and bangles. Chank beds are found on the west coast, in the Gulf of Kutch and the Arabian Sea, <sup>and</sup> on the east coast. The most productive beds are mainly in the Gulf of Mannar near Tuticorin, Kilakari and in the Palk Bay area. Durve (1975) recommended that they should be carefully monitored to ensure that depletion does not occur

through over fishing. A survey of the chank has also been carried out in Sri Lanka (Abbott, 1980).

The valves of the Giant clam (Tridacna and Hippopus) have been much in demand and have been used as fonts in churches, salad bowls in restaurants and wash basins in hotels among other things. One shell shop in London has them in stock but a pair may cost £300. The main threat to clams is not collection for the shell, but the Taiwanese who fish them for the meat of the adductor muscles, and throw the valves away. Considerable depletion has occurred in Australian waters but a 200 mile economic zone has been enforced and Taiwanese fishing vessels are no longer seen (Pearson, 1977).

The Pearly Nautilus (Nautilus pompilius) has been collected in large numbers although it is a deep sea rather than a reef species. Their use is very varied and apart from being used whole as ornaments (usually sectioned), 800 pearly nautilus were used in the chandelier of the Senate chambers in the State Capitol in the US (Taylor, 1976); currently there is a vogue for handbags inlaid with pieces of pearly nautilus, imported from the Philippines, and Abbott (1980) recommends that a survey should be carried out to see if this species is being overfished in Philippine waters. A number of scientists are studying Nautilus at present and so such research would not be too difficult to implement.

#### "Rare" shells

Certain species have been greatly sought after over the centuries for their rarity alone. These generally command very high prices and are collectors items. In many cases their rarity is due to the fact that they are deep water species and in the past

were difficult to obtain. With the development of new techniques of deep sea fishing and diving, such species are becoming more common, and their value will naturally drop as more come onto the market. However, there are fears that populations could be damaged, as demand is still high.

A business has recently started in London under the name of Rare Shell Investment Services which advises people on investing in rare shells (TRAFFIC (International) files). Their brochure maintains that values have increased with remarkable consistency and that shells are a better investment than, for example, carpets, firearms or Chinese ceramics, as 'there is little that can go wrong when investing in a disappearing rare commodity'. Investing in rare shells is particularly popular in the US and is becoming increasingly so in the Middle East. In 1980 it was recommended that investment in the following species would be profitable: Lambis violacea (Mauritius), Harpa costata (Mauritius), Cypraea nivosa (Indian ocean) and some of the Australian volutes (Lee, Rare Shell Investment Services, in litt., 1980). These species are listed among the fifty rarest shells in the world (Dance, 1969). The Australian volutes could be threatened by over collection (Taylor, 1980 in litt.) and although many specimens of H. costata are now in collections large fine specimens are still rare (Dance, 1969).

The Shell Collector magazine in Florida noted that deep water gill nets of Philippine fishermen had now made a number of rare species available such as Conus gloriamaris (Glory of the Sea - once thought to be extinct, but over 100 specimens now known Dance, 1969), C. dusaveli (Mauritius, but according to Dance (1969) only one specimen ever found) and Augeria sphaerula. An article



in the 'Carfell Philippine Shell News' (Anon, 1979) mentioned that high monetary returns for rare shells have encouraged fishermen to give up fishing for shelling. A fine nylon net is used, about 1m wide and 150m long, which is cast to lie 60-120 fathoms or deeper overnight and then pulled in. Obtaining rare shells is still a difficult business, so the fact that it is more worthwhile than fishing further emphasizes a big boom in collecting.

### Legislation

Many countries have legislation to control fishing for edible molluscs. In the US all coastal states have some form of control limiting size, quantities taken or times of the year that fishing may be carried out (Abbott, 1980), and many European countries have similar controls (Barletta, 1976). In many cases such legislation was drawn up only after it was realised that local depletion of populations was taking place.

A number of countries now indirectly protect molluscs through the establishment of marine parks, within the boundaries of which collection of marine organisms is usually forbidden. Such parks exist off the coasts of Australia, Florida, Kenya, Sri Lanka and many other countries (SS Coral Reef Group, 1979). These areas provide protected populations from which migration may occur to repopulate depleted areas.

Relatively few countries specifically control trade in ornamental shells. Japan and Australia have apparently recently implemented restrictions on commercial shell collecting (Abbott, 1980). In Kenya export of shells was previously permitted provided a license or permit was obtained. This legislation was poorly enforced though and shells could be freely taken out of the country

(Wells, 1978). In 1979 however, a complete ban on export was introduced (Anon, 1979); the increase in exports in 1978 (see Table 20) may have been due to traders getting rid of their stocks in anticipation of the ban. However apparently the legislation is confusing and poorly understood and shells are probably still leaving the country (Burton, 1980 pers. comm.)

In Papua New Guinea commercial shell collecting is controlled by the government. Collectors are instructed as to which species will sell well, and how they should be packaged to avoid damage and consequent wastage, and collecting areas are changed at regularly intervals (Anon, 1977a). No information is available on the effectiveness of this system.

A few countries have legislation for particular species. In Bermuda collection of the following species is prohibited: Queen and harbour conches (Strombus gigas), Bermuda cone, Bermuda and Calico scallops (Acquitecta gibbosa), Atlantic pearl oyster, netted olive (Oliva reticularis) and all helmet and bonnet shells (Cassidae) (Anon, 1976). There has also been a curb on the export of conch shells from the Bahamas (Anon, 1977) although they were still being exported in 1977 (see p.14). This curb has forced dealers to find new suppliers in Hawaii (Anon, 1977). The export of the Golden cowry (Cypraea aurantium), one of the most sought after and valuable rare shells, is forbidden from Fiji (Platt, 1949). Florida limits the collection of the Queen conch (Strombus gigas) to 10 per person per day to prevent commercial exploitation (Abbott, 1980). In 1971, legislation was introduced in South Australia to control exploitation of Cypraea thesities since populations had been considerably

reduced by collectors (Coleman, 1972).

### Conclusion

A great many observers including biologists, amateur shell collectors and conservationists are concerned about the possible decline of molluscs particularly on coral reefs and the damage which may occur through careless methods of collection, but further studies must be carried out to determine quantitatively the effect that collecting on a commercial level has on shell populations. It is unlikely that human exploitation could lead to the extinction of any one species of marine mollusc in view of their life history. Most marine molluscs have a huge reproductive capacity and produce planktonic larvae which may ensure wide dispersal, and account for the fact that many of the species in the ornamental shell trade have very wide distributions throughout the Indo-Pacific. Furthermore, for many species, it would be very difficult to find and collect every single specimen in a given area. Abbott (1980) points out that habitat disturbance, pollution and dredging are just as damaging as over collecting. A study by Rao in 1937 (Abbott, 1980) showed that the living population of Trochus in the Andaman Sea could number 300 million specimens; if this is correct, and Trochus reaches maturity and a collectible size in 4-5 years, it might be feasible to collect 10-20 million specimens a year.

However, in a number of cases there is evidence that over collection has led to local depletion and on occasions to economic , if not biological, extinction. In the Caribbean and off the coast of Florida a number of species are now uncommon through over collecting including the Pink Conch



(Strombas gigas), the Queen Helmet (Cassis madagascariensis), the Florida Horse Conch (Pleuroploca gigantea), Triton's Trumpet in Haiti (Charonia variegata), the Angel Wing (Cyrtoplenra costata), the Flamingo Tongue (Cyphoma gibbosum), and the King's Crown (Melongena corona), although they cannot be considered as endangered (Abbott, 1980). A number of dealers have mentioned that they are making money less easily than previously (Abbott, 1980) and a dealer in the UK was losing deals as a result of Philippine traders sending poorer quality shells that he had paid for (Anon, 1977). However demand for shells seems to be as high as ever, and with the increase in controls on coral exploitation, a number of dealers are expanding the shell side of their businesses to counteract the anticipated decline in the coral business (CNA, 1979).

Data from a preliminary study to look at the effect of shell collecting on mollusc populations in Kenya suggests that shell populations in unprotected areas may have a smaller mean length and less variation in size than those <sup>which are protected</sup> within marine parks (McClanahan and Muthigo, 1979). Since experience has shown that overcollection can have serious effects on edible mollusc populations, it is to be expected that the same may apply to the ornamental species.

At a preliminary meeting of the proposed Indian Ocean Alliance for Conservation in the Seychelles it was recommended that the problem of sea shell collecting should be considered at a national level and that protected areas should be established to provide breeding nuclei of marine molluscs (Anon, 1980). The Pacific Science Association at the XIV Congress in Khabarovsk

(USSR) in 1979 went further and included in their second resolution an appeal to all nations to stop the international trade in reef corals and molluscs for ornamental purposes. Barletta (1976) recommended that trade in the species used for the cameo industry (Cassis madagascarensis, Cypraea cassis rufa, and Stombus gigas) should be restricted by law.

Molluscs are an important economic resource in many countries, and a well organised ornamental shell trade could provide much needed income in developing countries. As pointed out by Abbott (1980) trade data can tell one little about the extent of over exploitation unless the ecology of the species is understood. Field studies urgently need to be carried out on species heavily involved in the trade to determine optimum yields or conservation measures that should be taken. In the Philippines such a programme is being undertaken for corals which are being collected for ornamental purposes, and since this country is one of the main shell exporters the programme should be extended to include molluscs as well. Abbott (1980) suggests a survey of the Pearly Nautilus should be carried out in these waters to determine if it is being overfished. Data is also needed on the extent to which both the meat and shell of different species are utilised; in a number of countries the meat of Cassidae, Stomidae and abalone is eaten and the shells exported but there are possibly a number of other species which could be used in this way.

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Table 1 Exports of Unworked coral and shells kg

Bracketed figures are those estimated from other countries import/export statistics

	1976	1977	1978
<b>Denmark</b>	37 053 1		
<b>Netherlands</b>	19 186 000		
<b>France</b>	1 461 000	5 805 022	4 729 917
<b>Belgium</b>	866 100	(3 946 402)	(2 742 892)
<b>Turkey</b>	888 908	(1 130 277)	(880 971)
<b>Italy</b>	542 226	52 414	(16 421)
<b>Greece</b>	151 000	8 837	(2 722)
<b>Spain</b>	125 623	1 453	(2 926)
<b>Portugal</b>	210 603	(4 262)	(15 234)
<b>West Germany</b>	76 761	(675)	(2 122)
<b>Sweden</b>	10 620		(66)
<b>Finland</b>	12 275		
<b>Switzerland</b>	214 700		
<b>West Germany</b>	7 000	(3 700)	
<b>Italy</b>	(32 000)		
<b>France</b>	(5 893)		
<b>Belgium</b>	(6 513)		
<b>Turkey</b>	(15)		
<b>Italy</b>	(6 718)		
<b>Spain</b>	(245)		
<b>Portugal</b>	0		
<b>Sweden</b>			
<b>Finland</b>			
<b>Switzerland</b>			
<b>West Germany</b>			
<b>Italy</b>			
<b>France</b>			
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Table 2

Imports of Unworked coral and shells kg.

	1976	1977	1978
<u>Europe</u>			
Sweden	17 165 000	15 807 000	16 634 000
Belgium	9 782 700	10 027 300	9 826 600
France	7 765 000	7 516 000	8 891 000
West Germany	7 305 600	7 622 600	6 198 000
Netherlands	5 021 000	7 054 000	5 445 000
Italy	5 424 600	5 411 400	4 415 500
UK	4 509 460	3 999 454	4 257 000
Switzerland	2 208 491	2 163 622	2 637 434
Spain	1 604 663	1 589 966	1 675 270
Portugal	1 673 800	1 538 500	1 914 300
Norway	66 000	556 000	836 000
Denmark	57 200	94 300	54 200
Yugoslavia	35 468	41 068	46 209
Greece	70 000		
<u>Asia</u>			
Singapore	10 685 782	13 162 561	10 757 376
Japan	8 068 343	9 771 640	11 060 325
Rep. Korea	2 594 000	4 028 582	6 464 485
Hong Kong	755 406	1 067 275	1 512 968
Taiwan	557 037	463 550	556 868
India	62 360	17 876	
Peninsular Malaya	33 250	108 881	
Sabah	49 920	23 792	
Sarawak	37 455	37 485	
Thailand	3 451	2 750	4 745
Indonesia	2 483	0	20 010
Philippines	237	117	10 456
<u>Other Countries</u>			
USA	4 690 671	5 053 552	5 053 220
Mexico	18 522		21 336
Barbados	43 694	3 103	
Brazil	7 368	4 297	
Colombia	1 239		
Guyana	190		
Australia	80 797	109 427	132 461
Tunisia	0	21 950	41 700
Kenya	72 900	71 900	31 400

Source: Published government statistics



Table 3

Exports of Worked Coral and Shells by Weight kg

	1976	1977	1978
Philippines	548 380	2 447 426	2 369 064
Taiwan	479 525	474 264	638 205
South Korea	109 214	58 704	59 324*
Japan	31 794	35 048	36 341
Italy	33 024	30 200	24 500
West Germany	6 560	15 161	1 488
Thailand	4 239	7 414	38 326
Belgium	12 300 *	4 400	1 200
UK	3 742	3 337	14 789
Mexico	15 106		
Netherlands	1 000	3 000	11 000
France	2 445	8 376	880
Spain	2 099	6 429	5 729
Denmark	1 200	0	1 100
Indonesia	710	0	6
India	199	162	
Norway		1 000	
Switzerland	235	203	
Brazil	35		

\* Jan-Nov

Source: Published government statistics

Table 4

Exports of Worked Coral and Shells by Value US \$

	1976	1977	1978
Philippines	15 141 642	11 757 208	12 028 187
Taiwan	6 788 763	8 618 526	18 716 583
Italy	5 969 054	6 738 692	7 983 063
Japan	3 331 568	4 159 963	4 721 187
South Korea	2 031 142	1 306 923	
West Germany	881 250	1 075 238	978 889
Thailand	87 388	95 443	131 866
France	63 800	189 574	102 381
Netherlands	14 000	16 087	182 000
Belgium	107 500	54 667	18 438
Switzerland	91 995	96 605	
Spain	11 129	24 722	54 522
UK	12 403	9 500	63 912
Mexico	30 743	115	
Denmark	12 931	1 552	3 922
Norway		7 500	2 600
India	2 834	6 589	
Sabah	1 615	3 725	
Indonesia	995	0	17
Malay. Penin	180	665	
Singapore	19	550	0
Brazil	691		

Source: Published government statistics

Table 5

Imports of Worked Coral and Shells by Weight kg

	1976	1977	1978
Japan	88 480	98 463	111 642
Fed. Rep. Germany	52 684	100 063	7 342
France	81 333	130 239	44 387
Spain	31 716	82 054	41 865
Italy	55 514	44 200	7 800
Netherlands	18 000	26 000	3 000
Norway	4 000	19 000	18 000
Belgium	7 200	11 700	16 400
UK	19 905	30 064	3 949
Sweden	13 000	2 000	not recorded
Switzerland	10 498	4 595	not recorded
Thailand	8 927	9 711	2 208
Denmark	3 800	4 900	3 200
Taiwan	2 196	3 804	2 713
South Korea	180	148	252*
Finland	117	648	not recorded
Philippines		67	30
Indonesia	0	43	244
Portugal	500	2 600	
Yugoslavia	46	2	3
Barbados	11	29	
Brazil	25		
Mexico	2		

Source: Published government statistics

\* Jan-Nov



Table 6

Imports of Worked Coral and Shells by Value US \$

	1976	1977	1978
USA	14 776 000	10 784 000	10 604 000
Japan	2 488 473	3 613 471	7 657 050
West Germany	3 481 250	4 793 810	5 373 333
France	2 302 400	2 794 468	1 525 476
Italy	556 264	1 233 838	2 343 061
Spain	912 845	1 435 735	958 245
Netherlands	402 400	815 217	935 500
Belgium	169 611	202 182	325 729
Denmark	85 690	104 655	102 353
Norway	25 192	110 000	99 000
UK	115 932	178 600	90 578
Switzerland	97 839	84 691	
Sweden	89 756	20 426	
Yugoslavia	73 074	13 978	5 690
Greece	49 351		
Sabah	30 659	12 734	
Portugal	7 365	27 920	
Australia	28 315	24 146	
Taiwan	0	31 289	10 921
Indonesia	0	17 413	88 575
Thailand	12 484	14 324	6 021
New Zealand	14 481	13 006	7 174
Malay Penin.	6 344	4 214	
Mexico	558	2 869	15 386
S.Korea	1 815	7 205	3 648
Finland	2 593	7 230	
Barbados	5 662	1 556	
Singapore	570	2 630	2 806
Brazil	1 147		
Philippines		635	30
Sarawak	80	20	

Source: Published government statistics

Table 7

Exports of Unworked Shells

Country	Type/Species	1976	1977	1978
USA	Marine shells	4 424 006	5 805 072	4 789 917
Philippines	Mother of pearl	202 062	214 715	466 952
	Trochus spp.	151 950	124 730	126 007
	Other shells	5 769 266	3 710 657	3 454 763
	Shell scrap & waste	935	22 941	114 850
	Total	4 007 243	4 075 049	4 165 512
Indonesia	Mother of pearl	504 506	466 253	547 075
	Trochus spp.	1 779 601	1 205 649	1 568 511
	Green snail	134 506	61 559	72 652
	Other shells	156 082	162 553	146 690
	Powder & waste of shells	66 080	-	-
	Total	2 253 879	1 875 359	2 395 228
Japan	Shells of shell fish	1 267 605	2 745 405	4 430 568
Zaire	Shells	1 159 460	not available	2 759 765
	Others	34 150		15 117
	Total	1 297 640		2 774 882
France	Shells	1 436 000	1 295 009	1 393 000
S. Korea	Pearl & abalone	75 000	22	5
	Oyster	749 216	445 150	1 345 825
	Other shells	-	294 402	109 577
	Powder & waste of shell	-	175 299	197 552
	Total	824 216	918 940	1 722 729
Australia	Pearl shells	358 441	417 000	318 462
	Other	437 105	1 567 536	592 595
	Total	775 606	1 905 496	911 055
Solomon Islands	Mother of pearl (blacklip)	11 057	6 466	5 970
	Trochus spp.	566 497	400 576	265 979
	Green snail	25 070	10 813	15 380
	Other shells	2 871	219	25 880
	Total	603 495	418 079	315 169
Tajik	Mother of pearl	18 788	8 064	not available
	Trochus spp.	217 651	477 558	
	Total	236 039	485 622	

Country	Type/Species	1976	1977	1978
India	Cornies	40 246	45 075	not available
	Chankas	55 111	17 844	
	Total	95 357	62 917	
Papua New Guinea	Mother of pearl	10 191	not available	not available
	Trochus spp.	227 600		
	Green snail	60 125		
	Other	2 759		
	Total	300 246		
Taiwan	Shell	146 080	181 531	107 553
	Shell waste	160 017	0	270 415
	Total	326 097	181 531	477 968
Thailand	Shells	30 707	88 121	67 216
	Powder & waste of shells	11 000	97 217	11 216
	Total	45 707	185 338	78 432
Spain	Mother of pearl	15 000	20 000	24 000
	Other (could include coral)	135 000	130 000	24 000
	Total	158 000	250 000	24 000
West Germany	Mother of pearl	42 709	130 000	20 000
	Other shells	172 209	72 000	13 000
	Total	214 918	202 000	
Yugoslavia	Shells	76 455	89 944	1 347
Ecuador	Shells	49 469	72 572	not available
Portugal	Shells (could include coral)	10 600	32 460	not available
	Others	20	26 600	
	Total	10 620	59 060	
Switzerland	Shells	no breakdown for shells		27
	Others (could include coral)			27 035
	Total			27 035
Hong Kong	Shell	none recorded	17 062	1 000
Madagascar	Conch shells (numbers)	none recorded	15 575	not available
Re-Exports	Shells	551 601	707 425	1 267 041
	Trochus	4 078	21 000	not available

Table 8

Estimated Exports of Shells kg

	1976	1977	1978
Netherlands	8 069 800	6 775 500	4 004 929
Denmark	4 515 200	4 886 500	3 321 752
US	3 150 497	4 572 515	4 159 098
Mexico	2 680 571	5 938 896	3 940 457
Philippines	3 135 415	5 199 848	3 224 628
Indonesia	1 313 080	1 768 200	2 087 688
South Korea	881 595	929 571	1 784 724
Japan	825 961	2 350 611	3 515 779
Haiti	873 723	1 100 171	802 286
Turkey	684 000	895 000	1 155 000
Australia	755 181	866 789	1 007 656
France	231 857	564 452	206 095
Solomon Islands	519 495	410 962	256 515
Marshall, Mariana, Caroline Islands	280 204	598 185	242 769
New Caledonia	213 086	112 084	852 202
Greece	178 000	195 000	172 696
Taiwan	195 260	162 555	111 072
Fiji	163 660	119 151	141 765
Papua New Guinea	116 975	187 592	196 962
Belgium	173 200	659 460	
Singapore	95 525	108 510	296 446
New Hebrides	95 321	139 165	209 224
India	95 728	98 879	212 601
Madagascar	169 400	8 600	116 427
Thailand	10 946	113 935	104 187
Kenya	154 594	83 666	89 729
Tanzania	152 385	15 566	21 277
Malaysia	178 574	74 001	165 500
Italy	83 380	65 917	668 928
Yugoslavia	84 000	59 000	74 000
Hong Kong	72 696	80 081	87 672
Mainland China	44 133	105 899	48 900
UK	43 290	52 020	325 396
Syria	39 000	37 000	51 000
Portugal	18 510	52 595	15 000
Mozambique	49 700	32 700	
Bulgaria	32 000		49 000
Macau	40 642	95 795	
Cook Islands	27 332	21 269	12 465
United Arab Emirates	25 000		23 940
Maldives	17 780	5 080	
New Zealand	13 050	998	15 512
Ecuador	3 535	1 140	12 671
North Korea		2 015	280
Afars Issas		13 000	
Federal Republic of Germany	6 240	5 968	587
Spain	108 787	100	1 146
Angola	2 700	36 800	
Yemen	3 000	8 100	
Central Africa		1 000	
South Africa		4 252	228 760
Austria		1 250	7 000
Bahamas			2 956
Greenland			19 996
Canada			1 028
Costa Rica			66
Panama			445
Turks & Caicos Islands	6		24 834
Cayman Islands			465
Qatar			1 426
Tonga			585
Mauritius			495
Reunion			3 139
Comoros			8 513
French Oceanic Territories			214 277
Burma	7 536		30 200
Romania			21 000
Tunisia			52 000
Chile			2 000
Vietnam			10 550
Sudan			39 000
Guinea			2 000
Saudi Arabia	5 100		
US Pacific Islands	50 000		
British Pacific Islands	25 762	10 200	
Argentina	96		
Uganda	4 510		
Paraguay			10





Table 10

## US Exports of Shells Ya

Country of destination	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
South Korea	9 361	4 949	1 980		10 277	11 783					23 298	26 074	27 539	51 393	124 937	214 402	538 760	507 839	312 331
Italy	58 483	57 267	10 031								20 366				15 310		27 288	36 734	32 685
West Germany	2 122	10 376	9 299						52 880	11 916		14 558		11 723	9 736				
Japan			13		473		361												
France	18 028	4 968	7 309																
Netherlands	3 165	3 090																	
Other countries	20 877	115	232	1 905	949	24 822	18 988	25 373	8 111	10 865	7 535	26 512	19 147	50 903	32 596	52 211	66 653	267 663	80 873
Total	112 056	80 675	23 884	1 905	11 695	36 605	19 349	25 373	60 991	22 731	31 199	67 144	46 686	114 021	182 609	266 613	652 701	812 253	405 894

Source: published government statistics

Table 11 Philippine Exports of 'other shells'

Country of destination	1970	1971	1972	1973	1974	1975	1976	1977	1978
Japan	1 155	602 721	500 152	1 000 321	1 088 025	1 220 718	1 531 263	1 504 308	1 730 457
USA	23 770	32 440	57 530	138 245	90 721	73 276	56 482	135 948	115 774
Canada	2 075	2 450	2 034	13 302	5 497	2 531	3 967	5 330	13 331
Mexico	5 826	10 323	20 774	31 355	25 901	17 445	9 101	16 414	23 930
Virgin Is.						1 600	2 110	300	2 280
Puerto Rico								7 810	2 240
Leeward/Windward								104	
Jamaica									
Bahamas									
Argentina	3 420	1 850	4 794	8 203	22 233		1 902	700	4 440
Brazil				4 475	1 775	1 505			4 286
Colombia									1 900
Spain	243 475	277 395	156 159	569 962	421 281	280 495	332 016	252 943	244 715
UK	40 653	122 914	130 981	406 317	264 277	373 017	342 151	410 265	137 616
Netherlands	72 264	68 226	127 308	218 383	202 724	144 263	163 250	154 065	197 065
Belgium	18 723	19 333	32 427	67 973	21 438	121 503	98 449	87 288	97 386
France	32 371	38 311	22 365	36 226	73 441	18 035	33 335	79 161	81 715
Germany	35 866	24 625	86 363	70 655	33 786	12 259	42 258	30 227	72 042
Italy	8 100	4 055	20 179	30 771	30 771	169 514	100 506	66 213	66 213
Greece	2 600	1 300	9 162	15 754	18 373	27 779	51 997	54 030	54 030
Denmark	2 740	2 740	1 400	15 375	30 642	15 967	4 300	26 398	2 637
Norway	3 996	1 569	1 215	12 960	10 580	5 915	7 559	12 920	5 902
Sweden		1 569	14 632	12 501	9 295	7 159	12 700	1 034	5 902
Switzerland		900	413	3 200		101	2 685	1 400	1 094
Portugal					3 250			17 122	2 206
Malta							427	280	85
Austria			1 400					36	
Rep. Ireland								475	
Finland								1 128	2 369
Israel			1 360		1 402	948	2 879	5 681	3 204
Japan	371 364	355 978	527 833	999 222	691 822	493 794	638 205	608 137	670 810
Hong Kong	41 240	6 757	6 275	20 347	18 305	35 523	33 225	109 242	109 177
Rep. Korea		7 530	3 311	3 276	21 324	2 000	13 439	26 263	33 572
Okina			2 353	44 503	27 743	20 259	21 480	8 845	9 100
Taiwan		10 307		5 778	4 540	28 264	15 843	6 285	24 792
Singapore			1 615		19 291	15 555		250	3 687
Thailand						46	1 963		600
Australia	18 745	18 534	23 624	30 593	36 616	34 343	33 760	35 211	56 130
New Zealand			3 157	2 650	2 914		17	428	
French Pac. Is.	238	101	11 415	1 448		1 934	5 376	2 711	3 981
Pac. Trust. Ter.					530	399	240	134	396
New Caledonia					642			635	2 233
Fiji								300	
Brit. W. Africa	350	277	1 345	6 936	3 702	1 760		1 465	
South Africa	4 000	923	400	480	600		3 318		
Swaziland									
Kenya		30							
Mauritius									
Fr. Ind. Oc.								11 236	3 405
Kuwait								270	241
Oman							250	270	
Total	1 341 434	1 630 717	2 341 614	4 200 774	3 310 243	3 101 051	3 103 266	3 710 651	4 200 774

Source: Published government statistics



Table 12

Philippines- Exports of Scrap shell kg

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Taiwan									
Japan	4 200	1 419	3 456 6 861			3 000	935	13 725	40 430
Korea Rep.									
Hong Kong	950								
UK			1 426						
Italy			730						
Greece			3 720					17	
France									
USA	8 750	3 440	8 360	97 000	19 000			9 190	34 420
Canada									40 000
Hawaii			100					9	
Total	13 900	4 859	26 653	97 000	19 000	3 000	935	22 941	114 850

Source: Published government statistics

Table 13 a

Exports of shells from Mexico

(Obtained from official trade statistics (1976) and British Embassy in Mexico (1978-79))

Country of Destination	1976	1977	1978*	1979
USA	280 277	not obtained		
Japan	911 363			
China	6 000			
Total	1 197 640		2 742 892	2 175 519

\* Imports went mainly to the US, secondly to Japan and also to West Germany, Italy and Hong Kong

Table 13b

Estimated Exports of Shells from Mexico kg

Importing Countries	1976	1977	1978
USA marine shells	1 134 415	1 648 273	1 670 545
Japan other shells	929 300	1 471 193	1 296 670
Hong Kong shells	12 095	26 129	6 120
Portugal	1 000		
S. Korea pearl, oyster, abalone & other shells	603 561	781 399	959 122
Spain other shells		2 000	17 000
Taiwan		6 000	
Thailand		850	
Total	2 680 371	3 935 844	3 949 457

Figures from official statistics of importing countries



Table 14

## Indonesia - Exports of 'other shells'

Country of destination	1970	1971	1972	1973	1974	1975	1976	1977	1978
Japan	124 279	93 032	230 191	300 616	204 966	176 233	83 849	108 606	130 333
Singapore	4 029	6 021	11 119	6 472	97 938	42 200	62 419	32 106	5 826
Hong Kong	6 183	46 634	15 350	19 964	80 274	12 876	12 615	7 415	5 608
Rep. Korea		1 772	4 022			5 000			
Taiwan				3 060	2 352				775
Malaysia					2 421				
Fed. Rep. Germ.	59 635	23 119	103 748	149 631	80 905	22 431	200		4 148
Italy	4 600		43 575	150 864	95 155			155	
Spain				3 930		10 000			
Netherlands	4 616	2 416	6 265	59 959					
France	1 020	1 263							
UK					6 431				
Hungary						10 000			
Belgium	130							50	
USA			24 565	26 138	20 452	7 260		14 226	
Australia					500				
Total	204 492	174 257	438 835	720 634	591 394	286 000	159 082	162 558	146 690

Source: Published government statistics

Table 15a

Japan Exports, Shells of Shell Fishes (kg)

Country of Destination	1976	1977	1978	1979
South Korea	819 036	2 328 526	3 990 865	7 048 250
Taiwan	206 784	178 529	198 730	325 145
USA	122 492	117 449	97 866	78 523
Canada	21 281	24 731	34 445	33 597
Portugal	16 000	20 000	24 500	22 880
Egypt			9 525	21 500
Spain	14 272	13 057	3 550	16 695
Hong Kong	2 500	1 150	3 341	10 496
West Germany	16 876	22 564	18 630	10 432
Italy	11 504	1 794	5 633	6 640
South Africa	6 846	9 950	8 351	2 808
Australia	9 881	8 865	8 180	9 217
Other countries	20 223	18 790	17 852	17 161
Total	1 267 695	2 745 405	4 430 508	7 603 344

Source: Published Government statistics

Table 15b

Japan Exports of Similar Substances to Coral and  
shells; powder and waste (kg)

Country of Destination	1976	1977	1978	1979
Taiwan	9 600	23 450	40 000	56 500
West Germany	50 245	39 308	44 176	42 618
Netherlands	31 347	11 212	9 626	25 245
USA	37 973	30 863	35 916	17 084
Italy	4 271	10 475		11 305
Australia	6 483	7 686	4 023	10 405
Other countries	44 674	40 395	20 087	26 085
Total	184 593	163 389	153 828	189 242

Source: Published Government statistics



Table 16

Estimated Exports from Haiti kg  
Figures taken from statistics for  
importing countries

Importing Countries	1976	1977	1978
USA	763 195	964 798	578 718
Japan	61 533	43 373	124 738
Spain	49 000	92 000	88 000
Taiwan			10 824
Total	873 728	1 100 171	802 280

Table 17

Solomon Islands - Exports of 'other sea shells' kg

Countries of Destination	1976	1977	1978
Australia		119	25 467
Papua New Guinea			413
New Zealand	400		
Japan	2 186		
USA	285	100	
Total	2 871	219	25 880

Source: Published government statistics

Table 18

Australia Exports of Shells other than Mother-of-Pearl  
(kg)

Countries of Destination	1976	1977	1978
Hong Kong	189 004	1 257 348	391 349
South Korea	182 621	150 480	193 859
Japan	30 770	10 867	
UK	3	97 299	4 205
Italy	16 245	28	
USA	780	10 688	26
West Germany	7 371	8 018	40
Spain	5 575	48	250
France	1 799	1 514	
Papua New Guinea	242	144	2 685
New Caledonia	84	70	179
Indonesia		5 497	
North Korea		3 875	
Taiwan		1 075	
Singapore		526	
Netherlands	18	32	
Mauritius	266		
South Africa		17	
Polynesia		9	
Belgium	1		
Fr. Atl. Territs.		1	
New Zealand	2 386		
Total	437 165	1 547 536	592 593

Source: Published government statistics

Table 19

Tanzania - Exports of Corals, Shells, their Powder and Waste kg

Country of destination	1974	1975	1976
USA	44 900	150 300	164 300
Canada	600	9 800	3 800
UK	70 000	64 700	57 200
France	27 700	16 000	18 900
Italy	34 100	27 900	18 400
Netherlands	14 500	5 400	11 600
Fed.Rep.Germany	8 100	9 900	20 500
Spain	3 600	3 300	1 900
Belgium	1 500	1 900	2 300
Greece	2 400		1 400
Israel		8 400	4 400
Norway			300
Australia	2 700	2 700	1 900
Japan	24 000	46 900	26 100
Pakistan	31 600		1 000
Singapore		2 200	300
India	1 000	62 400	15 800
Mauritius		300	500
Total	266 700	412 100	350 600

Source: published government statistics

Table 20

Kenya - Exports of Corals, Shells, Powder and Waste (kg)

Country of destination	1974	1975	1976	1977	1978
USA				20 100	25 500
Italy	35 700	11 300		41 600	29 800
UK	16 200	4 000		17 900	23 700
Fed. Rep. Germany	1 000	22 900		1 500	8 500
Netherlands	2 300				2 000
France				400	500
Belgium					200
Spain					2 200
Greece					400
Norway				100	
Australia				800	800
Japan	3 200			3 400	1 700
Pakistan	9 000			2 000	6 000
Singapore					1 600
India				300	
Saudi Arabia				900	3 800
Uganda				100	200
Zaire					200
Other countries					200
Total	67 400	38 200	0	89 100	107 500

Source: Published Government statistics



**India Exports of Marine Shells**

**Table 21a**

Figures from 'Statistics of Marine Products Exports 1978' published by a Government of India

Quantity kg Undertaking (provided by P. Kannan)

Country of destination	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
USA	40	510	2 176	1 580	1 650	2 800	24 212	25 709	11 782	65 585	104 828
Hong Kong					12 040	1 070	7 000	11 479	9 663	32 070	4 536
Japan	12 125	4 188	34			8 124	14 580	6 120	9 699	15 550	8 720
Fed. Rep. Germany			19	1 000	1 320	200	465	160	2 179	21 760	1 555
Netherlands		169		119	1 570		40	348	2 500	4 548	22 600
Italy	7 112	135	15	20	1 580	53 225	573	2 065		5 329	2 552
Spain				42 200	11 600	55 995		450	27 750	5 000	
UK	860	200		147		690	1 556	2 293	1 540	711	5 355
France	50	14	200	600	35 393	80	26 768	569	445	45	4 074
Belgium				50			386	335	500	170	30
Canada				820				195	50	550	
Singapore	80				51		2 062	58			10 000
Malaysia							5 670	240		420	1 599
Australia											
Tanzania	100	147	200								
Greece					693	277				677	70
Saudi Arabia	144						3 000			50	250
Oman											50 000
Bahrain										150	150 000
Kuwait											100 050
UAE											60
Thailand								6 706		462	
Colombo							658				
Norway						45					
Ireland							358				
Sweden							4 000				
Taiwan											
Total	20 511	5 565	2 644	48 096	117 488	69 854	92 600	54 642	65 899	150 687	465 789

Table 21b

India - Exports of other Corals and Shells kg

Country of destination	1976	1977
Spain	20 741	52 625
Italy	15 000	8 177
Fed.Rep.Germany	2 257	11 866
France	2 756	8 329
UK	3 593	9 700
Netherlands	98	6 885
Czechoslovakia		5 090
Norway	1 655	
Belgium	2 655	545
USA	20 047	21 328
Canada	195	200
Nepal	6 450	108 695
Japan		7 495
Korea Rep.		4 000
Hong Kong	14 908	9 567
Singapore		2 750
Kenya		2 000
Saudi Arabia		250
Oman	50	15 641
Kuwait		99 667
Syria		1 000
Total	90 405	375 810

Source: Published government statistics

Table 22

Malaysia Domestic Exports of Coral and Shells kg

Countries of Destination	1976	1977
Singapore	1 180 759	10 713 234
Hong Kong	184 807	7 751
Japan	10	2 011
Australia		508
S. Korea	1 615	508
Philippines	346	
Total	1 367 537	10 724 012

Table 23

Malaysia Re-Exports of Coral and Shells kg

Countries of Destination	1976	1977
Singapore	48 569	23 802
Hong Kong	7 822	406
Philippines		41
Total	56 391	24 249

All re-exports are recorded from Sabah and Sarawak

Source: Published government statistics for West Malaya, Sabah and Sarawak

Table 24

Imports of Unworked Shells kg

Country	Type/Species	1976	1977	1978
Japan	<i>Pinctada margaritifera</i>	302 451	274 489	355 931
	<i>P. maxima</i>	297 692	245 906	335 174
	<i>Tectus niloticus</i>	1 613 810	1 805 595	2 579 301
	Other shells	5 445 466	7 105 295	7 020 353
	Total	7 657 419	9 431 285	10 288 724
France	Shells	7 604 000	7 452 000	8 764 000
USA	Marine Shells	4 014 489	4 621 237	4 297 096
S Korea	Oyster	187 929	162 217	153 737
	Pearl shell	374 774	986 572	960 463
	Green abalone	1 096 280	1 500 475	1 990 016
	Other shells	-	1 437 379	3 282 439
	Total	1 658 983	3 886 643	6 386 660
West Germany	Mother of pearl	167 800	241 100	not given
	Other shells	7 197 800	7 581 500	
	Total	7 365 600	7 822 600	
Hong Kong	Shell	732 450	1 061 095	1 505 791
Spain	Mother of pearl	799 000	639 000	821 000
	Other shells (could include coral)	746 665	820 848	561 236
	Total	1 545 665	1 459 848	1 382 236
Switzerland	Shells			2 550 684
	Other (could include coral)	not broken down		86 750
	Total			2 637 434
Portugal	Shells	783 400	895 300	not available
	Other (could include coral)	890 400	643 200	
	Total	1 673 800	1 538 500	
Taiwan	Shell	276 466	215 692	285 295
	Shell waste	272 096	244 578	270 410
	Total	548 562	458 070	555 705
Yugoslavia	Shells	28 664	27 592	21 229
Mexico	Shells	18 522	not obtained	21 055
India	Cowries	56 291	5 740	not available
	Chanks	0	150	
	Total	56 291	5 890	
Brazil	Shells	7 368	4 289 (waste)	not available
Thailand	Shells	2 542	2 327	4 343
	Powder & waste		322	302
	Total	2 542	2 649	4 645
Indonesia	Shells	2 475	none recorded	10
	Powder & waste of shells			20 000
	Total	2 475		20 010
Philippines	Shell	937	117	10 441
	Scrap & waste of shell			15
	Total	937	117	10 456
Bahamas	Conch shells (No.)	3 555	710	



Table 25

## Japan - Imports of 'Other Shells' kg

Country of origin	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
USA	2 979 919	649 955	1 725 479	2 466 202	1 622 250	2 030 776	2 970 244	4 154 268	3 208 854	3 553 513
S. Korea	20 700	77 577	658 390	159 457	258 500	627 873	880 417	922 648	1 774 755	2 247 800
Mexico	675 618	846 871	765 697	1 218 755	1 955 261	1 055 500	929 500	1 471 195	1 296 670	657 800
Philippines	316 134	368 207	389 450	695 634	564 018	336 738	296 158	275 866	538 066	350 856
Indonesia	24 777	73 688	136 481	157 185	125 555	156 284	155 870	82 205	106 788	92 553
Taiwan	54 675	65 157	142 574	126 816	70 877	61 933	45 260	49 514	35 952	60 515
Haiti	51 405	97 887	29 379	145 009	160 017	79 797	61 553	43 373	124 738	56 808
Papua New Guinea	5 019	2 084	16 561	10 359	28 972	48 630	26 877	16 815	27 258	17 170
Australia	18 021	13 414	18 992	55 625	58 189	24 622	19 371	14 660	6 968	11 820
Solomon Islands	2 052	5 556	50 848	74 040	14 417	17 509	16 179	15 658	16 444	7 150
New Hebrides			7 345	10 156	23 940	14 000	5 587	26 726	16 972	6 245
Tanzania	50 157	68 544	25 985	24 519	22 482	36 571	19 575	10 917	2 716	8 595
Kenya	864	559	850	2 285	5 588	.	1 000	5 559	5 546	6 750
India	8 738	8 528	12 251	9 156	9 080	7 258	6 120	4 741	9 129	5 049
Madagascar	800	500	1 850	500	200	250	1 400	1 600	800	
Singapore	5 189	5 597	12 307	1 651	1 016	6 272	4 400	5 165	1 250	
Ecuador	1 296	1 200	2 554	5 225	15 406	1 172	555	1 140	1 190	3 120
Bismarck Arch	2 547	18 978	18 451	11 055	7 941	6 200				
Malaysia	5 089				406	2 400	468	2 000	5 415	4 128
Thailand	8 000	5 651	7 100		5 000	30	8	9 500	18 700	520
Hong Kong		4 765	22 675	24 159	5 900					
Burma			4 064	12 011	5 991					
Brazil	2 000	691	917	5 612						
Mainland China										
France		188	920	195	410	736	640	977	5 000	364 800
Italy	5 622	6 840	975	605	400		2 000	964	1 962	2 559
Other countries	51 522	53 495	17 491	2 441	6 440	4 905	106	16 228	2 205	1 500
Total	4 245 724	2 575 490	4 025 542	5 214 566	4 960 256	4 516 854	5 445 466	7 105 295	7 020 558	7 486 600
Other countries are:	Ryukyu TNew Guin S Africa	Ryukyu Bahamas Zambia TNew Guin MM Car	Fiji Ryukyu TNew Guin Argentina F Ocean	Sri Lanka Greenland	Sri Lanka Mozambique Fiji	Sri Lanka Ind. Oc Cook Is	Mozambique Panama	Cook Is. New Cal N Korea	New Zealand Fiji Comoros S Africa N Korea Reunion	New Cal Gilbert Is Comoros S Africa UK Yemen

Source: Published Government statistics

Table 26

## Japan - Imports of Substances Similar to Coral and Shells; Powder and Waste

Country of origin	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Philippines	74 861	115 430	103 665	319 954	263 458	229 946	290 950	241 569	557 261	289 151
S. Korea	27 000		152 320	264 448	34 451	10 248	4 719	7 203	4 784	56 828
Taiwan		106 025	10 897	14 760	37 016	245 423	109 349	12 153	180 500	180 495
Indonesia			6 300	62 226	13 100				1 500	700
Mexico		42 650	27 650						23 400	10 000
USA				123		1 100	100	40 448	20 448	500
Haiti	619	2 500		2 000	500	300				
France	1 219	1 850	1 899	4 268	4 985	1 396	2 826	4 089	5 551	7 466
Papua New Guinea			3			6 000				7 433
Other countries	243 770	202 653	51 494	10 900	0	0	80	23 869	30 243	1 480
Total	547 469	471 106	354 228	678 679	553 510	464 413	408 024	329 331	623 487	553 853
Other countries are:	Ryukyu Mainland China Bismarck Arch. Fiji Fr. Oc.	Ryukyu Australia	Ryukyu Singapore	Hong Kong Thailand			W. Germany Australia	W. Germany N. Korea	W. Germany Gilbert & Tuvalu	Mainland China Solomon Is.

Source: Published government statistics

Table 27

France Imports of Unworked Shells kg

Countries of Origin	1976	1977	1978
Netherlands	2 157 000	2 142 000	2 901 000
Denmark	3 301 000	2 898 000	2 632 000
Turkey	684 000	893 000	1 153 000
Greece	178 000	195 000	171 000
Yugoslavia	84 000	59 000	74 000
Madagascar	91 000		89 000
Philippines		55 000	65 000
Syria	39 000	37 000	51 000
New Caledonia	135 000		
Bulgaria	32 000		49 000
Indonesia		37 000	
Japan		20 000	
UK			251 000
Austria			7 000
Italy			28 000
Tunisia			52 000
Romania			21 000
Other countries	903 000	1 106 000	1 220 000
Total	7 604 000	7 442 000	8 764 000

Source: Published government statistics





Table 29

South Korea Import of 'other shells' kg

Country of origin	1977	1978
Japan	1 066 992	2 580 190
Indonesia	194 416	229 691
Philippines	24 802	72 939
India	31 000	44 783
USA	44 827	32 909
Thailand	27 248	7 500
Singapore	15 000	182 337
New Hebrides	10 000	1 000
Australia	7 954	30 760
Papua New Guinea	5 000	6 500
Malaysia	4 888	10 090
South Africa	4 252	
Central Africa	1 000	
Solomon Islands		2 000
Mainland China		39 900
Hong Kong		6 820
Burma		5 200
UK		3 000
Mexico		10 900
Guinea		2 000
Other countries		13 920
Total	1 437 379	3 282 439

Source: published government statistics

Table 30

West Germany Imports of 'other shells'

Country of origin	1976	1977
Netherlands	5 911 800	4 631 500
Denmark	633 700	1 229 700
France	226 500	537 500
Belgium	173 200	639 400
Philippines	154 400	175 400
Japan	54 500	33 100
Italy	12 800	9 800
Taiwan	2 600	6 100
Other countries	28 300	119 000
Total	7 197 800	7 381 500

Source: Published government statistics

Table 31

Hong Kong Imports of Mollusc Shell kg

Country or origin	1976	1977	1978
Australia	271 287	316 195	704 529
Indonesia	174 789	199 346	148 678
Singapore	58 366	49 823	74 438
Philippines	47 401	117 540	91 845
Fiji	35 852	50 627	37 217
Macau	40 642	93 795	
Mainland China	27 027	104 266	2 607
Solomon Islands	11 232		
Malaysia	10 287	5 013	11 795
Mexico	12 095	26 129	6 120
Papua New Guinea		13 918	1 500
Thailand	1 938	16 377	33 789
USA	939	43 018	104 001
Japan	2 449	13 563	6 610
India	1 479	1 502	19 045
South Korea		6 923	6 514
South Africa			200 381
Burma	3 556		20 000
Other countries	33 061	3 060	36 722
Total	732 450	1 061 095	1 505 791

Source: Published government statistics

Table 32

Spain Imports of 'other shells' kg

Country of origin	1976	1977	1978
Philippines	577 000	573 000	375 000
Haiti	49 000	92 000	88 000
Madagascar	20 000	7 000	18 000
Italy	27 000	25 061	19 000
USA	14 005	10 001	8 577
France	4 000	25 120	366
Portugal	15 000	50 000	15 000
Japan	9 000	15 600	3 420
Taiwan	2 846	8 000	5 000
UK	2 000	6 019	2 000
Mozambique	10 000		
Mexico		2 000	17 000
Kenya			5 000
Tanzania	360	931	4 000
Netherlands	1 000		
Indonesia	80	3 000	
India	1 000		279
Australia	16	43	7
Fed. Rep. Germany	260	68	587
Other countries	14 096	3 005	
Total	746 663	820 848	561 236



Table 35

Italy Imports of Unworked Coral & Shells kg

Country of Origin	1976	1977	1978
Denmark	2 259 226		
Japan	545 563	301 300	14 800
Indonesia	426 677	405 800	
Philippines	419 476		
Sudan	312 022		
USA	178 269		
Malaysia	167 762		
Netherlands	124 350		
Haiti	117 495		
Australia	115 692		
New Caledonia	115 040		814 000
UK	97 519		
France	95 002		
Fiji	58 607		
Mozambique	46 706		
New Zealand	45 740		
Portugal	37 415		
W. Germany	30 594		
Kenya	28 916		
India	26 306		
Singapore	25 237		
Papua New Guinea	22 917		
Tanzania	21 170		
Mexico	20 000		
Taiwan	17 316	315 600	55 000
Ecuador	10 595		
Madagascar	10 000		
Tunisia	4 751	6 700	3 600
Algeria	3 765	5 100	
Spain	3 393		8 200
Other countries	59 168	4 376 900	3 519 900
Total	5 424 669	5 411 400	4 415 500

Other countries in 1976 were:

Ireland	Somalia	Honduras
Austria	Seychelles	Bahamas
Yugoslavia	S. Africa	Colombia
Greece	N&S Yemen	Thailand
Romania	Polynesia	China
Albania	S. Korea	Turkey

Source: Published government statistics

Table 34

Australian Imports of Coral and Shells kg

Country of origin	1976	1977	1978
Philippines	49 825	70 714	75 080
Japan	12 966	21 130	7 709
Taiwan	1 369	3 876	4 325
Indonesia	84	3	
Mainland China	20	10	7
India		1	294
Thailand	23		
Hong Kong		11	14
Singapore		7	
Mexico	4 624	4 618	4 536
USA	5 487	2 655	2 793
Haiti		1 424	4 393
Solomon Islands	575	203	25 000
New Hebrides	200		
Fiji			190
Polynesia	3		
Papua New Guinea	485	930	105
New Zealand	36	65	307
France	2 453	758	1 094
Italy	408	391	854
Denmark	811	896	200
UK	13	43	228
South Africa	300	94	1 592
Tanzania	745	325	3 340
Kenya		1 008	400
Sudan		255	
Total	80 427	109 417	132 461

Source: Published government statistics

Table 35

Singapore Imports of Coral and Shells kg

Country of origin	1976	1977	1978
Malaysia	10 537 152	13 134 340	10 670 289
China	20 679		
Philippines	30 900	395	11 511
Papua New Guinea	9 473	3 400	10 160
Burma	5 082		138
Thailand	3 726		
India	.. 1 .	12 750	10 912
Japan		1 000	5 000
Mozambique		2 330	500
New Caledonia	.. . . .	2 000	30 000
Kenya		2 000	3 370
Australia		3 597	
Other Countries	78 768	749	15 496
Total	10 685 781	13 162 561	10 757 376

Source: Published government statistics

Table 36

Malaysia Imports of Coral and shells kg

Country of origin	1976	1977
Philippines	49 920	24 361
Taiwan	30 578	101 587
France	1 940	5 150
Fed. Rep. Germany	1 016	
India	406	132
Singapore	37 445	34 570
Indonesia		1 605
Thailand		1 676
USA		142
Total	121 305	169 223

Source: Published government statistics for West Malaysia,  
Sabah and Sarawak



Table 37

Kenya Imports of Corals and Shells kg

Country of origin	1974	1975	1976	1977	1978
Somalia	57 100	21 200	13 000	18 800	14 900
Tanzania				51 500	5 300
Madagascar	200				500
South Yemen			21 900		
Saudi Arabia			15 100		
France			100		
UK		700			
Italy	100				
USA	500				200
Other countries	3 500	1 200	22 800	1 600	10 500
Total	61 000	23 100	72 900	71 900	31 400

Source: Published government statistics

Table 38

Exports of Unworked Pearl Shell kg

	1976	1977	1978
Indonesia	504 598	446 223	587 975
Australia	338 441	417 960	318 462
Philippines	202 062	214 715	466 932
Malaysia	(161 819)	(57 000)	(138 000)
Taiwan	(133)		
Fr. Oceanic Terr.	(100 000)	(197 000)	(194 000)
Madagascar	(57 000)		
India	(40 000)	(19 000)	(57 000)
Cook Islands	(27 332)	(17 097)	(12 485)
Fiji	18 388	8 064	(17 088)
Spain	15 000	76 000	34 000
Solomon Islands	11 057	6 466	5 930
Japan	(110 122)	(565 431)	(297 352)
Papua New Guinea	10 191 *	(7 168)	(32 725)
New Zealand	(10 056)		(13 000)
Hong Kong	(10 002)	(1 250)	(11 665)
Thailand	(9 000)	(2 000)	(3 700)
W. Germany	82 500	130 900	
Afars Issas		(13 000)	
Singapore	(5 229)	(12 257)	(8 421)
Sudan			(39 000)
USA			(26 000)
Burma			(5 000)
Mexico			(2 000)
UK Ocean Terr.	(10 000)		

Source: Published government statistics

Figures in brackets are estimated from other countries imports.

\* 1975-1976

Table 39

## Indonesia - Exports of Unworked Mother of Pearl kg

Country of destination	1970	1971	1972	1973	1974	1975	1976	1977	1978
Japan	1 235	18 528	73 713	8 721	34 949	137 527	225 065	157 073	165 731
Singapore		48 695	19 542		77 024	88 174	176 266	164 567	190 933
Hong Kong		25 967	16 036	12 688	7 402	25 600	51 250	83 106	94 336
Rep. Korea	3 444	2 021				5 000	.		102 975
Taiwan									10 000
Fed. Rep. Germ.	31 162	4 034	72 067	59 490		22 958	40 520	41 477	24 000
Italy	72 906	14 598	10 811		15 470	4 196			
Netherlands	63 364	5 902	47 740						
UK	2 689			2 744	6 257				
Spain					10 250				
USA	4 225				6 969	16 885	11 497		
Total	179 025	119 745	239 309	82 643	157 421	300 340	504 598	446 223	627 375

Source: Published government statistics

Table 40

## Philippines - Exports of Unworked Mother of Pearl kg

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Japan	483 565	191 074	199 420	184 085			109 858	81 139	194 539
South Korea	111 375	123 122	98 816	181 785			89 295	80 944	181 557
Hong Kong	6 330	1 400	948	8 400	needed	needed	2 909	38 148	78 220
Singapore	2 000	3 697	1 000				.	2 000	5 000
Taiwan	2 280								
USA	14 550	300	1 500	1 400				2 899	1 616
New Zealand	3 000								
Italy	2 285	820	8 953	6 664				4 090	
UK								5 495	6 000
Spain	3 000			10 500					
Fed. Rep. Germ.	12 000			140					
France									
Australia				200					
Total	640 385	320 413	310 637	393 174			202 062	214 715	466 932

Source: Published government statistics



Table 41

Australia Exports of Unworked Pearl Shell kg

Country of Destination	1976	1977	1978
USA	134 532	117 878	117 381
W. Germany	106 430	149 017	51 789
UK	23 283	35 986	109 823
Italy	33 623	59 114	3 500
Japan	27 673	40 785	20 422
Israel	5 000		1 188
Hong Kong	7 900	15 180	2 706
S. Korea			11 653
Total	338 441	417 960	318 462

Source: Published government statistics

Table 42

Imports of Unworked Pearl Shell kg

	1976	1977	1978
Spain	799 000	639 000	821 000
Japan	600 143	520 395	689 065
W. Germany	167 800	241 100	(76 973)
S. Korea	374 774	986 572	960 468
Hong Kong	(67 706)	(138 493)	(175 262)
Singapore	(176 623)	(164 567)	(195 933)
USA	(146 029)	(120 782)	(118 997)
Israel	(15 000)	(117 500)	(9 188)
Italy	(42 055)	(63 204)	(11 500)
UK	(23 283)	(60 581)	(115 823)
Taiwan	(300)	(2 000)	(28 000)
Haiti	(189)		
France		(51 500)	

Source: Published government statistics

Figures in brackets estimated from export statistics  
of other countries

Table 45

Japan - Imports of *Pinctada Margaritifera* kg

Country of origin	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Philippines	284 350	176 533	160 876	212 462	138 306	49 972	143 314	131 428	180 547	207 805
Indonesia	117 397	97 977	116 583	135 928	70 985	126 419	102 000	104 200	134 653	117 299
Papua New Guinea	13 459	10 770	17 394	10 816	12 858	10 659	7 908	6 996	2 725	5 063
Fiji	9 813	4 013	6 023	2 379	1 381		3 312		11 000	19 577
Cook Islands						9 128	27 332	17 097	12 485	8 715
Solomon Is.	3 730		6 177	24 898	11 992	6 000	8 334	7 932	4 226	6 544
Fr. Oc. Terr.	13 020	4 000	4 203				10 056		5 000	8 566
New Zealand	1 985									
Australia										
Hong Kong										
Other countries	22 371	3 095			1 209		195	3 829	7 315	15 583
								1 250		4 700
								1 757		10 940
Total	466 123	296 388	311 256	586 483	256 731	211 299	302 451	274 489	355 931	402 592
Other countries include:	Malaysia New Guin. Territ. Bismark Arch, France UK	New Guin. Territ. USA			Thailand		Malaysia	Singapore		Kenya M.M. Car.* Singapore

(\* M.M. Car = Marshall, Mariana &amp; Caroline Islands)

Table 44

Japan - Imports of Pinctada maxima kg

Country of origin	1970	1971	1972	1975	1974	1975	1976	1977	1978	1979
Philippines	257 827	57 109	64 921	42 519	3 500	2 000	80 450	55 200	147 068	169 046
Indonesia	1 764	15 605	101 508	85 262	75 505	145 427	175 212	153 425	141 176	168 567
Australia	122 472	164	147 475	85 781	46 561	56 276	55 911	54 111	25 752	60 847
Burma	65 024	15 240	42 675	77 218	21 844			1 000	5 000	40 000
Thailand	6 500	8 858	9 815	15 744	5 140		254	172	2 700	
Papua New Guinea	18 669	20 065	35 652	28 001			5 229			
Singapore	2 216	2 155		4 471	2 556	5 940	2 224			
Malaysia	16 255						279			
Solom Islands	3 191	1 075	3 844					2 000	6 088	676
Fiji										
UK		1 565		2 686	1 884	1 788	155		5 550	2 000
Other countries	4 659	8 884								
Total	498 557	275 088	405 686	557 482	154 570	189 451	297 692	245 906	555 154	441 156
Other countries include:	Taiwan Korea Panama USA	Territ. New Guinea					Taiwan		Hong Kong India	Yemen

Source: published government statistics



Table 45

USA Imports of Unworked Mother of Pearl and Trochus

Country of origin	1960	1961	1962	Jan/Aug 1963
Australia	372 011	378 614	213 107	140 070
Japan	141 894	192 566	135 785	11 006
New Zealand	17 085	2 600	14 284	3 048
Fr. Pac. Islands	17 020	4 096	826	3 061
Arabia	28 565	8 150		
Aden	9 868	13 206	7 156	6 095
Panama	746			
Saudi Arabia	9 095			
W. Germany	2 835	893	18 288	
Italy	932			3 999
Burma	6 095			
Philippines	21 896	1 640	3 919	676
Hong Kong	1 288			
Br. W. Pac. Is.	3 161			
Sudan	9 998			
Fr. Somalia	2 000			
Br. Somalia	2 032			
India		1 800		
Iran		5 136		
Thailand		1 016		
Singapore			45	2 055
Indonesia			4 925	
New Guinea			8 180	
Total	646 521	609 717	406 515	170 010

Source: Published government statistics

Table 46

Exports of Unworked Trochus kg

	1976	1977	1978
Indonesia	1 379 601	1 205 049	1 588 511
Solomon Islands	566 497	400 576	265 979
M.M.Car.*	(280 204)	(398 183)	(242 769)
Papua New Guinea	227 600 **	(144 491)	(127 008)
Fiji	217 651	477 558	(87 400)
Philippines	154 950	124 736	126 967
New Caledonia	(78 086)	(102 043)	(852 202)
New Hebrides	(89 734)	(102 437)	(191 252)
Taiwan	(18 000)	(35 800)	(2 500)
Australia	(16 912)	---	
Mainland China	(12 060)		
Thailand		(59 010)	(30 400)
Hong Kong		(19 750)	(14 570)
India		(9 000)	(5 000)
Singapore		(810)	(9 000)
Fr. Oceanic Terr.			(20 277)

\* M.M.Car. = Marshall, Mariana &amp; Caroline Islands

\*\* 1975-1976

Table 47

## Indonesia - Exports of 'Troca or Lola' kg

Country of destination	1970	1971	1972	1973	1974	1975	1976	1977	1978
Japan	604 464	601 126	790 153	926 584	333 869	310 518	337 966	445 411	633 629
Singapore	176 835	144 787	479 840	539 296	599 726	359 700	885 255	539 975	752 313
Hong Kong	134 564	277 240	101 754	70 956	45 813	89 732	81 046	99 620	49 889
Taiwan			1 600		4 122	.			3 000
Rep. Korea			2 847						6 000
'Yunani'	5 125								
Malaysia									3 680
Italy	472 227	185 363	256 132	98 701	206 778	30 000	60 000	50 025	45 000
Fed.Rep.Germany	101 835	197 987	214 124	138 349	94 950	75 053	5 334	35 000	60 000
France	47 315	74 836	46 125	31 726	15 303	20 000	10 000	35 018	20 000
Spain	64 532	148 350	46 024	51 134	309 175	14 834			
Netherlands	209 555	71 559	197 335	102 484	26 708				
UK	66 585								
Belgium	5 135								10 000
Czechoslovakia									5 000
Denmark									
USA	6 663								
Total	1 894 835	1 701 248	2 135 934	1 959 230	1 636 444	909 989	1 379 601	1 205 049	1 588 511

Source: Published government statistics

Table 48

Solomon Islands - Exports of 'Trocas' kg

Country of Destination	1976	1977	1978
Hong Kong	8 665	-	-
Singapore	13 714	14 079	-
Japan	492 366	341 116	211 197
UK	-	-	4 072
Fed. Rep Germany	51 752	45 381	50 710
Total	566 497	400 576	265 979

Source: Published  
Government statistics



Table 49

## Philippines - Exports of 'Trochea' shell kg

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Japan	304 804	145 142	220 192	292 049	112 966	55 678	66 908	43 550	72 721
Kinawa					150	295			
Hong Kong	23 000	5 248		2 000	1 627				4 570
Singapore					57 990	39 975	20 000	2 000	9 820
Rep. Korea									2 000
Taiwan						15 000			
Spain	7 806	133 725	61 074	48 545	61 827	43 450	41 047	15 702	16 919
Italy		4 750	18 180		10 000		26 220	59 984	20 462
France	5 000	1 135			22 220				
UK		4 750				9 975		3 500	
Portugal		7 000	4 400	3 000					
Fed.Rep.Germ.				6 000		75			
Netherlands	4 000								
USA						3 900			
Argentina							775		
Total	344 610	301 750	303 846	351 594	266 780	168 343	154 950	124 736	126 967

Source: Published government statistics

Table 50

Imports of Unworked Trochus kg

	1976	1977	1978
Japan	1 613 810	1 805 595	2 579 301
Singapore	(918 969)	(554 054)	(752 788)
Hong Kong	(177 076)	(160 825)	(54 459)
W. Germany	(149 859)	(171 503)	(110 710)
Italy	(130 878)	(386 489)	(65 462)
Spain	(115 673)	(25 862)	(16 919)
UK	(10 160)	(3 500)	(4 072)
Switzerland	(10 159)		
France	(10 000)	(35 018)	(20 000)
Taiwan	(5 110)		(5 000)
New Zealand		(1 000)	
W. Samoa		(91)	
S. Korea		(2 000)	(15 820)
Malaysia			(3 680)
Czechoslovakia			(10 000)
Denmark			(5 000)
Argentina	(775)		

Source: published government statistics

Table 51

## Japan - Imports of Tectus niloticus kg

Country of Origin	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Indonesia	744 283	786 077	841 619	910 600	347 643	430 652	334 888	409 167	650 797	462 118
M.M. Car*	145 216	227 508	362 473	364 973	183 770	203 033	280 204	398 183	242 769	474 152
Solomon Islands	421 770	278 012	386 118	403 322	162 834	468 449	483 469	389 392	210 845	161 250
New Caledonia				30 020		29 862	78 086	102 043	852 202	242 703
Fiji	81 566	44 704	50 686	71 253		7 112	31 496	46 524	87 400	106 944
Philippines	391 549	219 532	259 079	396 561		96 018	193 099	88 988	135 281	177 191
Papua New Guinea	60 840	79 314	142 932	172 364		129 881	75 862	144 491	127 008	91 567
New Hebrides		30 720	17 564			45 000	89 734	102 437	191 252	52 494
Thailand	13 798	18 800	27 095	25 245	24 333			59 010	30 400	27 946
Taiwan	34 800		10 000	3 000			18 000	35 800	2 500	26 840
India	41 041	55 000	20 000	25 000	4 240			9 000	5 000	2 000
Australia	46 505	6 096		21 160		10 000	16 912			31 120
Hong Kong	4 000							19 750	14 570	11 295
Mainland China				19 950	53 100	25 000	12 060			
Malaysia	102 305	15 748	5 080	3 048	4 318					
Singapore	40 721	45 729	35 574	15 254	1 016	2 986		810	9 000	5 598
Rep. Korea				2 175	1 700					
Bismark Arch	255 540	157 140	65 677	37 954	1 729				20 277	20 000
Fr. Oc. Territ.				68 233						
Territ. New G.	155 726	99 958	19 558							
Burma			6 096	12 201						
Ryukyu	45 550	22 150	1 000			10 000				
Spain										
Total	2 585 380	2 064 488	2 220 551	2 781 313	1 188 320	1 457 993	1 613 810	1 805 595	2 579 301	1 893 218

Source; published government statistics

\* M.M.Car = Marshall, Mariana &amp; Caroline Islands

Table 52

## Indonesia - Exports of 'Burgos' or Greensnails kg

Country of destination	1970	1971	1972	1973	1974	1975	1976	1977	1978
Japan	3 126	37 215	59 485	45 174	39 700	50 842	64 930	32 947	35 537
Hong Kong	1 210	35 589	3 872	15 785	23 107	17 402	50 232	20 391	15 200
Singapore	19 583	734	979		17 836	28 150	42 436	2 070	13 315
Rep. Korea					8 967	2 000			10 000
Fed. Rep. Germ.	5 300	2 039				1 590			
France	1 550							121	
Netherlands	9 376								
Spain	5 588								
Italy	518								
Total	44 251	75 577	64 336	60 959	89 610	99 894	144 598	61 529	12 052

Source: Published government statistics



Table 53

Solomon Islands - Exports of Green Snail kg

Country of Destination	1976	1977	1978
Hong Kong	516	-	-
Singapore	2 125	551	-
Japan	19 808	9 378	12 994
W. Germany	621	889	2 386
Total	23 070	10 818	15 380

Source: Published government statistics

Table 54

Papua New Guinea Exports of Unworked Shells kg  
July 1975 - June 1976

Country of Destination	Trochus	Green Snail Shell	Mother of Pearl	Others
Japan	91 701	26 630	8 788	624
Spain	54 209	25 000		
W. Germany	41 979	218	914	
Italy	24 341			349
UK	10 160			
Taiwan	5 110		300	881
Singapore		8 277		
Haiti			189	
Australia				100
Belgium				5
Bulgaria				360
Netherlands				11
Total	227 600	60 125	10 191	2 330

Source: published government statistics

Table 55

South Korea Imports of Green Abalone Shell kg

Country of Origin	1976	1977	1978
Mexico	588 736	772 451	946 222
USA	125 747	72 430	753 783
Australia	172 971	220 118	115 276
Japan	156 816	206 691	167 565
Indonesia	23 871	18 245	
Philippines	10 139	2 290	7 170
Hong Kong	12 000	1 000	
Malaya	6 000		
Austria		1 250	
Total	1 096 280	1 300 475	1 990 016

Source: Published government statistics

Table 56

Philippines Exports of Unworked Capiz Shells kg

Country of Destination	1970	1971	1972
Hong Kong	59 999	10 935	
Japan	71		
Switzerland	11 048		
Spain	5 347		
Belgium	1 045		
Fed.Rep. Germany	700		
Sweden			969
USA	1 900		118
Total	80 110	10 935	1 087

Source: Published official statistics



Table 57

India Trade in Unworked Cowries and Chanks kgCowries - Imports

Country of origin	1976	1977
Maldives	17 780	5 080
Tanzania	22 591	660
UK	15 290	
Total	56 291	5 740

Cowries - Exports

Country of destination	1976	1977
USA	38 392	42 224
UK	927	814
Netherlands		1 099
Fed.Rep.Germany		936
Total	40 246	45 073

Chanks - Imports

Country of origin	1976	1977
Singapore		150
Total		150

Chanks - Exports

Country of destination	1976	1977
Italy	20 000	13 956
Spain	20 000	
France	15 076	
Fed.Rep.Germany		80
USA		3 808
Malaysia	55	
Total	55 111	17 844

Source: Published government statistics

Table 58a

Exports of Worked Mother-of-Pearl by Weight kg

	1976	1977	1978
Taiwan	461 487	456 213	609 355
S Korea	109 214	58 704	59 324 *
Japan	29 271	32 767	34 686
Thailand	4 239	7 414	38 326
W. Germany	6 087	14 738	
Italy	9 989	11 400	
Spain	33	0	5 724
France	980	3 000	
Netherlands	1 000	0	
Denmark	1 000	0	
Indonesia	710		6
Mexico	15 094		
Switzerland	235	203	
Belgium		500	
UK	552	186	
India	199	162	
Brazil	35		

\* Jan-Nov

Source: published government statistics

Table 58b

Exports of Worked Mother-of-Pearl by Value US \$

	1976	1977	1978
Taiwan	2 940 263	2 862 105	4 260 167
S Korea	2 031 142	1 306 923	1 832 930
Japan	686 301	836 129	1 198 032
Thailand	87 388	95 443	131 866
W. Germany	312 917	329 524	
Italy	129 447	125 930	
Spain	337	0	52 382
France	17 600	57 234	
Netherlands	6 400	435	
Denmark	11 207	0	
Indonesia	995		17
Mexico	4 731		
Switzerland	91 995	96 605	
Belgium	361	13 485	
UK	12 403	9 500	
India	2 834	6 587	
Brazil	691		
Singapore	19	550	
Hong Kong	165 594 HK\$	404 396 HK\$	1 134 199 HK\$

Table 59a

Imports of Worked Mother-of-Pearl by Weight kg  
Including mother-of-pearl for button making

	1976	1977	1978
Japan	87 259	96 560	108 552
France	71 667	100 092	
W. Germany	48 995	96 236	
Spain	29 582	81 081	40 946
Italy	24 682	42 400	
UK	14 623	18 000	
Switzerland	10 498	4 595	
Thailand	8 927	9 714	2 208
Netherlands	5 000	6 000	
Belgium	4 200	4 000	
Norway	4 000	4 000	
Denmark	3 400	3 700	
Taiwan	2 185	2 117	2 695
Portugal	500	2 500	
Finland	117	648	
S Korea	180	148	252 *
Brazil	25		
Barbados	11	29	
Indonesia		43	244
Yugoslavia		1	3

\* Jan-Nov

Source: published government statistics



Table 59b

Imports of Worked Mother of Pearl by Value US \$

	1976	1977	1978
Japan	780 461	1 081 479	2 064 743
France	656 000	934 255	
W Germany	565 417	1 118 571	
Spain	318 138	820 556	815 350
Italy	236 535	395 856	
UK	115 932	178 600	
Switzerland	97 839	84 691	
Thailand	12 484	14 324	6 021
Netherlands	47 200	39 565	
Belgium	55 417	93 879	
Norway	25 192	23 462	
Denmark	75 862	53 103	
Taiwan	4 000	9 500	7 222
Portugal	7 270	26 566	
Finland	2 593	7 230	
S Korea	1 815	7 205	5 648
Barbados	5 662	1 556	
Brazil	1 147		
Indonesia	-	17 413	
Yugoslavia	-	13 978	252
Singapore	570	2 630	2 806
Greece	10 243	-	
Australia	(July-Dec) 28 315	24 146	21 704
Malaysia	36 991	16 968	
Hong Kong	1 611 549 HK\$	4 024 159 HK\$	9 427 894 HK\$

Table 60

Philippines Exports of Worked Shell

	1976	1977	1978
Shell handbags (No)	2 363 422	1 700	63 465
Shell lampshades (kg)	545 057	633 913	968 561
Light fittings			
Worked Capiz shells (No)	1 219 432	2 499 200	2 349 484
Worked Mother of Pearl (No)	5 750	117 837	140 140
Shell buttons (kg)	3 323	4 877	
Shell lanterns (No)		235	85
Other worked shells (kg)		1 808 636	1 400 503

Source: Published government statistics

Table 61

Taiwan Exports of Worked Mother-of-Pearl kg

	1976	1977	1978
Ornamental articles	193 717	165 281	154 078
Rings, bracelets etc	49 986	45 866	87 620
Powder cases	6 221	16 856	30 030
Plates & rods	2 235	4 025	92 908
Unmounted beads	2 067	6 427	2 673
Tobacconist sundries	1 518	3 304	1 257
Articles for religious use	614	1 238	3 888
Others	205 129	213 216	236 901
Total	461 487	456 213	609 355

Source: Published government statistics

Table 62

South Korea Exports of Worked Mother-of-Pearl kg

Country of Destination	1976	1977	1978
Japan	45 927	22 006	16 060
USA	37 720	13 051	10 178
Hong Kong	12 754	16 429	19 371
Singapore	7 005	200	805
W Germany	2 231	1 932	609
Indonesia	949	-	-
Spain	913	491	5 305
France		320	1 433
Kuwait			1 960
United Arab Emirates		1 330	1 120
Other Countries	1 715	2 945	2 483
Total	109 214	58 704	59 324

Source: published government statistics



Table 63

Japan Exports of Worked Mother-of-Pearl kg

Country of Destination	1976	1977	1978
USA	14 480	6 403	3 377
Spain	11 089	17 546	24 106
France	72	2 232	4 171
Netherlands		2 100	507
Taiwan		1 233	471
Other Countries	3 630	3 253	2 054
Total	29 271	32 767	34 686

Source: published government statistics

Table 64a

Hong Kong Exports of Pearl Buttons (1 000 buttons)

Country of Destination	1976	1977	1978
Singapore	1 289	826	201
Australia	94	1 237	5 759
Taiwan	162	1 964	3 585
USA	260	202	522
UK		201	202
Mauritius	10	23	126
Portugal		234	1 461
S. Korea			1 677
Thailand		49	1 050
Other countries		230	455
Total	1 915	4 956	14 405

Source: published government statistics

Table 64b

Hong Kong Re-exports of Pearl Buttons (1 000 buttons)

Country of Destination	1976	1977	1978
Taiwan	22	515	257
Australia			1 251
Singapore	115		747
Total	137	515	2 259

Source: Published government statistics

Table 65a

Japan Imports of Worked Mother-of-Pearl kg

Country of origin	1976	1977	1978
S. Korea	43 274	35 162	34 501
Philippines	18 898	18 792	20 323
Mainland China	7 468	16 787	7 537
Taiwan	692	1 515	761
Other countries	128	146	919
Total	70 460	72 402	64 041

Table 65b

Japan Imports of Mother-of-Pearl for Buttonmaking kg

Country of origin	1976	1977	1978
S. Korea	16 799	23 953	44 511
Philippines	-	205	-
Total	16 799	24 158	44 511

Source: published government statistics



Table 66a

W. Germany Imports of Worked Mother-of-Pearl kg

Country of origin	1976	1977
Philippines	42 293	83 078
Hong Kong	1 763	1 099
Italy	443	831
Japan	815	1 510
Other countries	184	128
Total	48 995	96 236

Table 66b

UK Imports of Worked Mother-of-Pearl kg

Country of origin	1976
Philippines	10 095
Mainland China	3 430
Hong Kong	435
Italy	139
Thailand	201
S. Korea	118
Japan	111
Other countries	94
Total	14 623

Source: Published government statistics

Table 66c

France Imports of Worked Mother-of-Pearl kg

Country of origin	1976	1977
Philippines	55 309	64 702
Italy	3 590	2 302
Belgium		9 938
Singapore		4 000
Other countries	12 768	19 150
Total	71 667	100 092

Source: Published government statistics

Table 66d

Spain Imports of Worked Mother-of-Pearl kg

Country of origin	1976	1977	1978
Japan	26 006	68 020	22 079
Philippines	1 081	1 759	9 283
Hong Kong	826	5 782	1 294
Taiwan	731	955	1 894
Italy	465	481	4 404
Switzerland	167	47	9
S Korea	125	156	57
Thailand	92	351	200
Mexico	44		85
USA	40		5
W. Germany	5	8	163
Mainland China			1 015
Other countries		3 522	4
Total	29 582	81 281	40 946

Source: Published government statistics

Table 66e

Italy Imports of Worked Mother-of-Pearl kg

Country of origin	1976	1977
Philippines	19 244	18 500
W. Germany	1 814	
Mainland China	1 179	
Japan	998	
Thailand	780	
Hong Kong		13 000
Other countries	667	10 900
Total	24 682	42 400

Source: Published government statistics



Table 67

US - Imports of Articles of Shell US \$ 1 000

Country of Origin	1970	1971	1972	1973	1974	1975	1976	1977	1978
Philippines	518	555	561	914	1 588	6 400	6 303	4 699	4 555
Taiwan	11	27	40	122	405	571	715	545	78
Japan	269	305	436	489	570	362	356	346	254
South Korea		5	15	79	85		212	210	226
Hong Kong	119	185	291	187	94	119	78	71	99
West Germany	15	73	105	52	84	102	101	97	159
India	5	5	4	5			67	88	118
Italy	22	25	12	51	81	62	62	69	45
Mainland China			31	19			67	76	144
Mexico	4	2	11	15		89			168
Other countries *	46	20	22	81	165	264	314	226	954
Total	807	976	1 526	1 992	2 872	7 969	8 275	6 427	6 818

\* other countries=

Canada  
Cayman Islands  
Haiti  
Colombia  
UK  
France  
Belgium

Switzerland  
Spain  
Iran  
Israel  
Pakistan  
Thailand  
Indonesia

Australia  
New Zealand  
Cook Islands  
Egypt  
South Africa  
Guinea Bissau  
Czechoslovakia

Table 68

US Imports of Shell or Pearl Buttons (1 000 buttons)

Country of origin	1967	1975
Philippines	357 696	88 115
Japan	274 320	333 936
Italy	5 328	
W. Germany	2 830	
France	288	
Mexico		364
Other countries	4 608	4 604
Total	645 120	427 019

Table 69

Hong Kong Imports of Shell Buttons (1 000 buttons)

Country of origin	1976	1977	1978
Japan	32 832	69 984	115 620
USA	2 016	720	1 671
Italy	28	7	22
W. Germany		1 584	1 061
Taiwan		72	7 283
Mainland China		84	450
Philippines		30	300
UK			238
Total	34 876	72 481	126 645

Source: Published government statistics

Table 70

FAO Statistics for Catches and Landings of Shells  
Metric Tonnes

a) Pearl Oyster Shells      Pinctada spp

	1974	1975	1976	1977
Australia	205	247	292	190
Japan	30	30	34	39
Fiji	15	10	10	17
Total	250	287	336	246

b) Trochus

	1974	1975	1976	1977
Solomon Islands	317	534	480	400
Fiji	256	168	255	274
Australia	2	21	0	0
New Caledonia	0	0	0	0
Total	575	723	735	674

c) Marine shells not elsewhere included

	1974	1975	1976	1977
Mexico	3 612	2 089	2 349	3 866
Tanzania	268	558	351	400
Kenya	100	72	49	16
Yugoslavia	58	61	176	193
Total	4 538	3 280	3 425	5 045

Fig 1. US Exports of Marine Shells 1960-1978

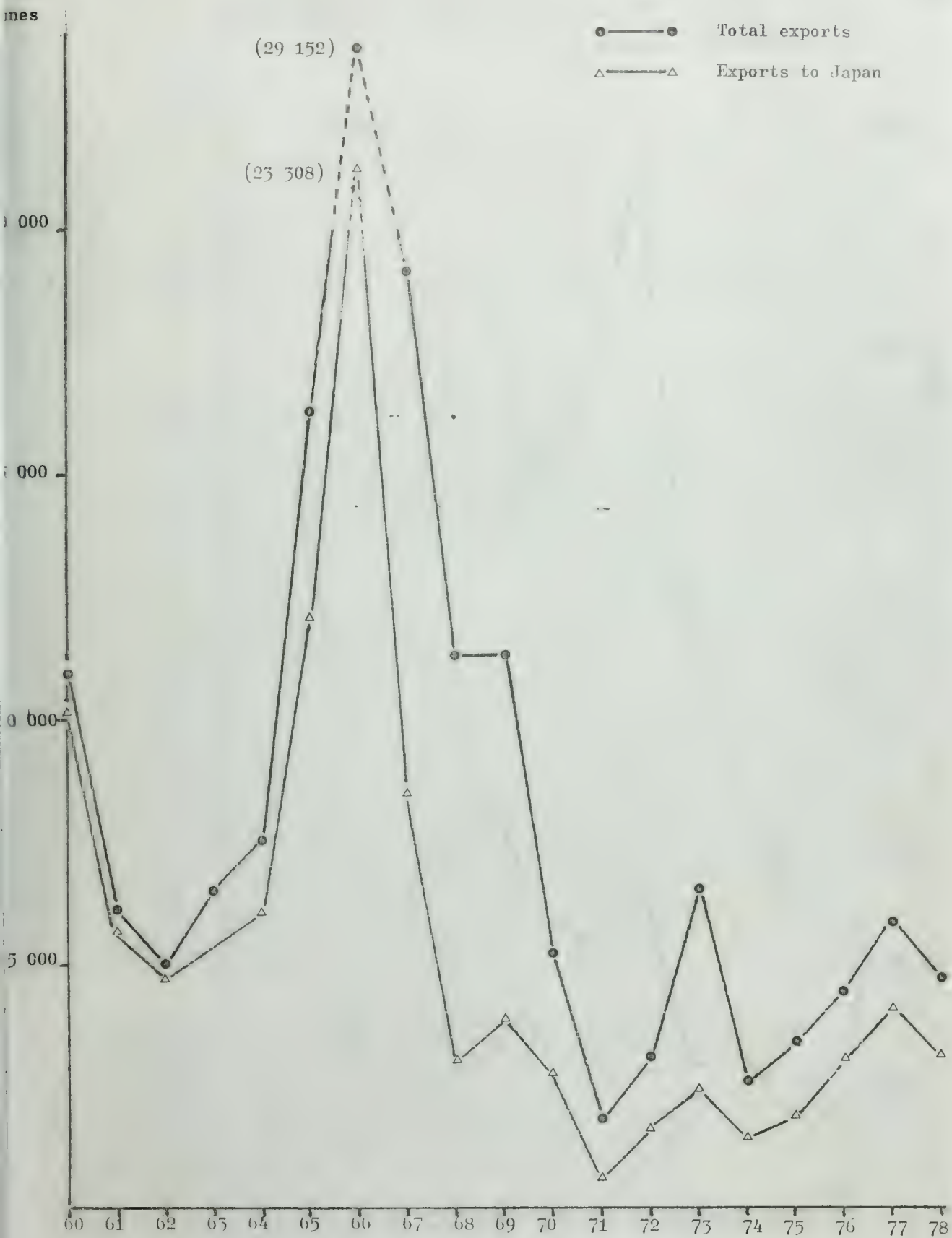




Fig.2 Philippine exports of 'other shells' 1970-78

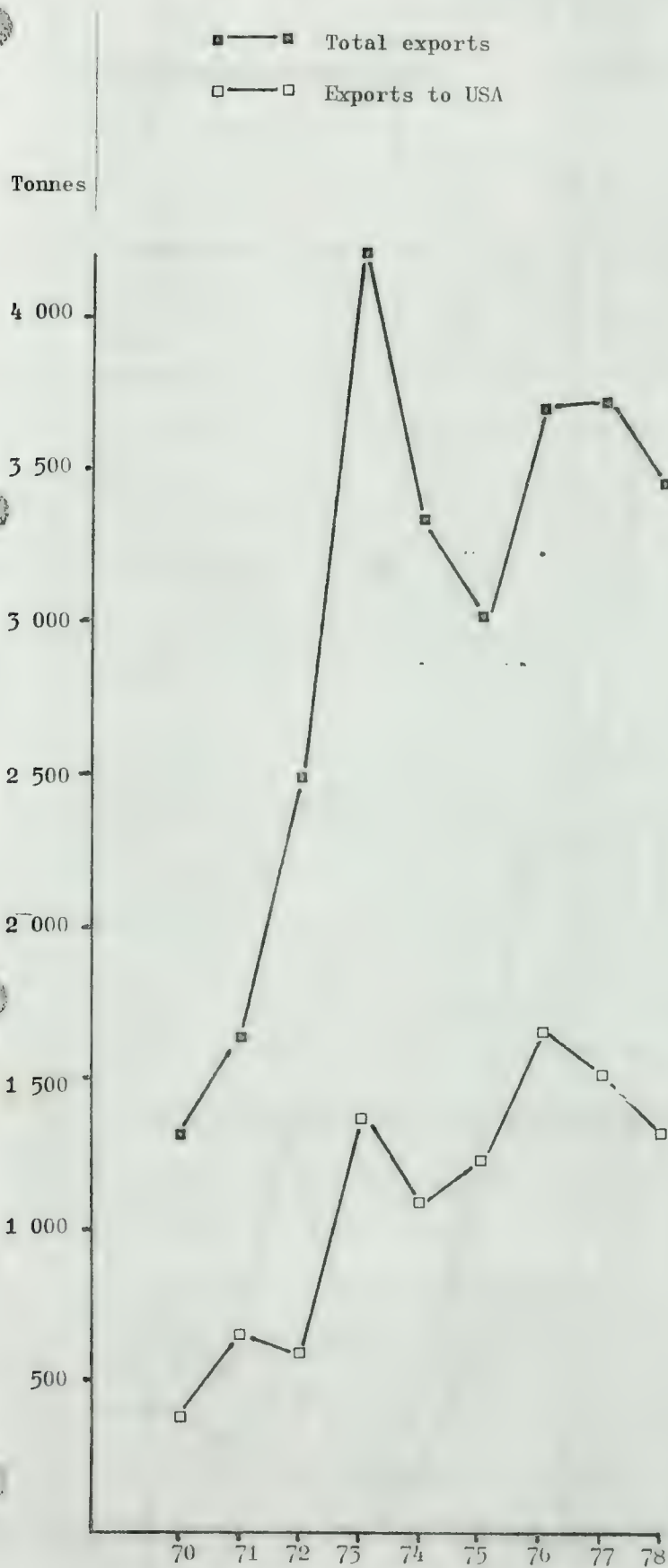


Fig 3.

Japanese Imports of 'other shells' 1970-78

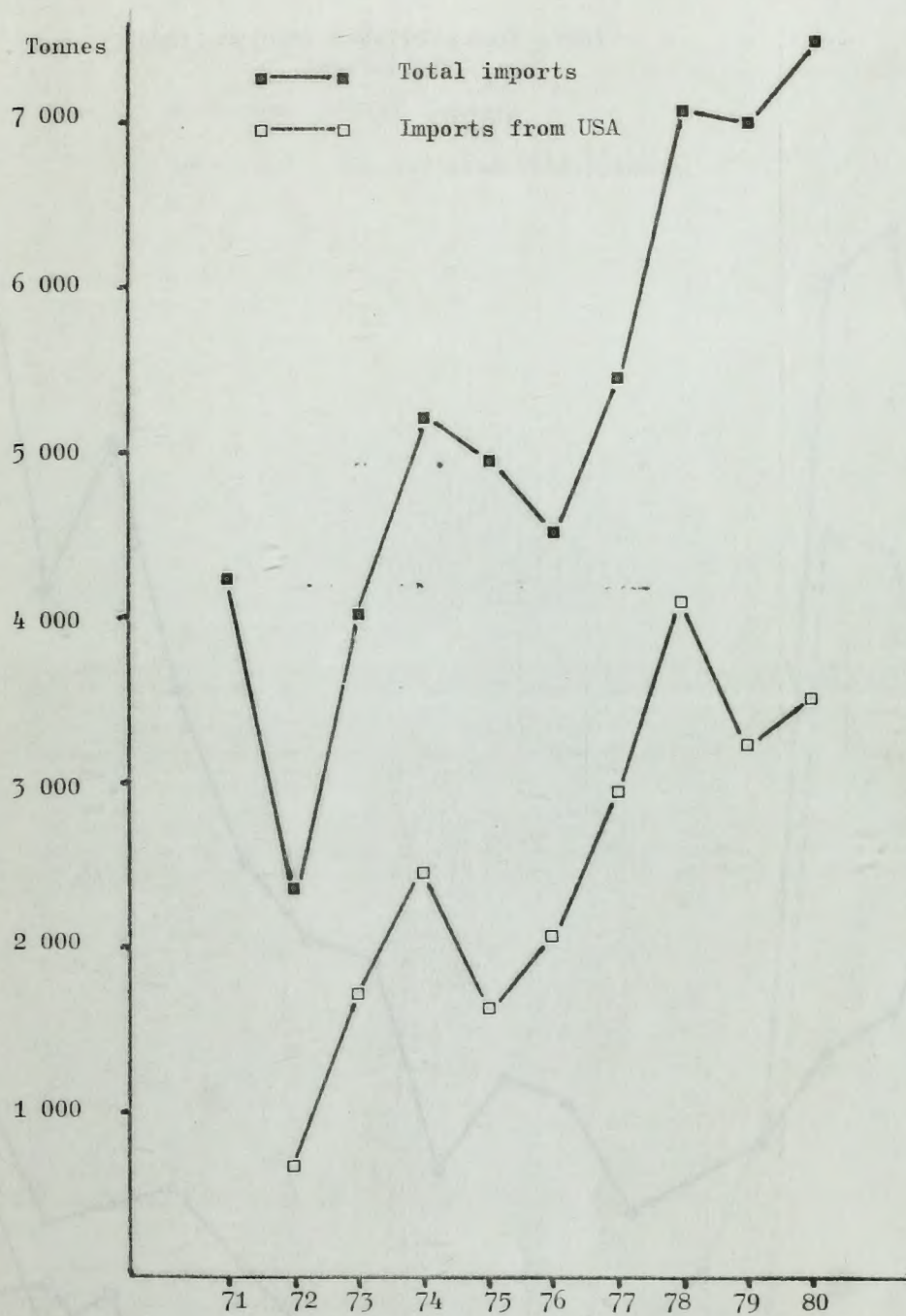


Fig 4

## US IMPORTS OF MARINE SHELLS

1960-1978

Total imports ●  
 Imports from Mexico □  
 Imports from Philippines △  
 Imports from Haiti ○

(data from published foreign trade statistics)

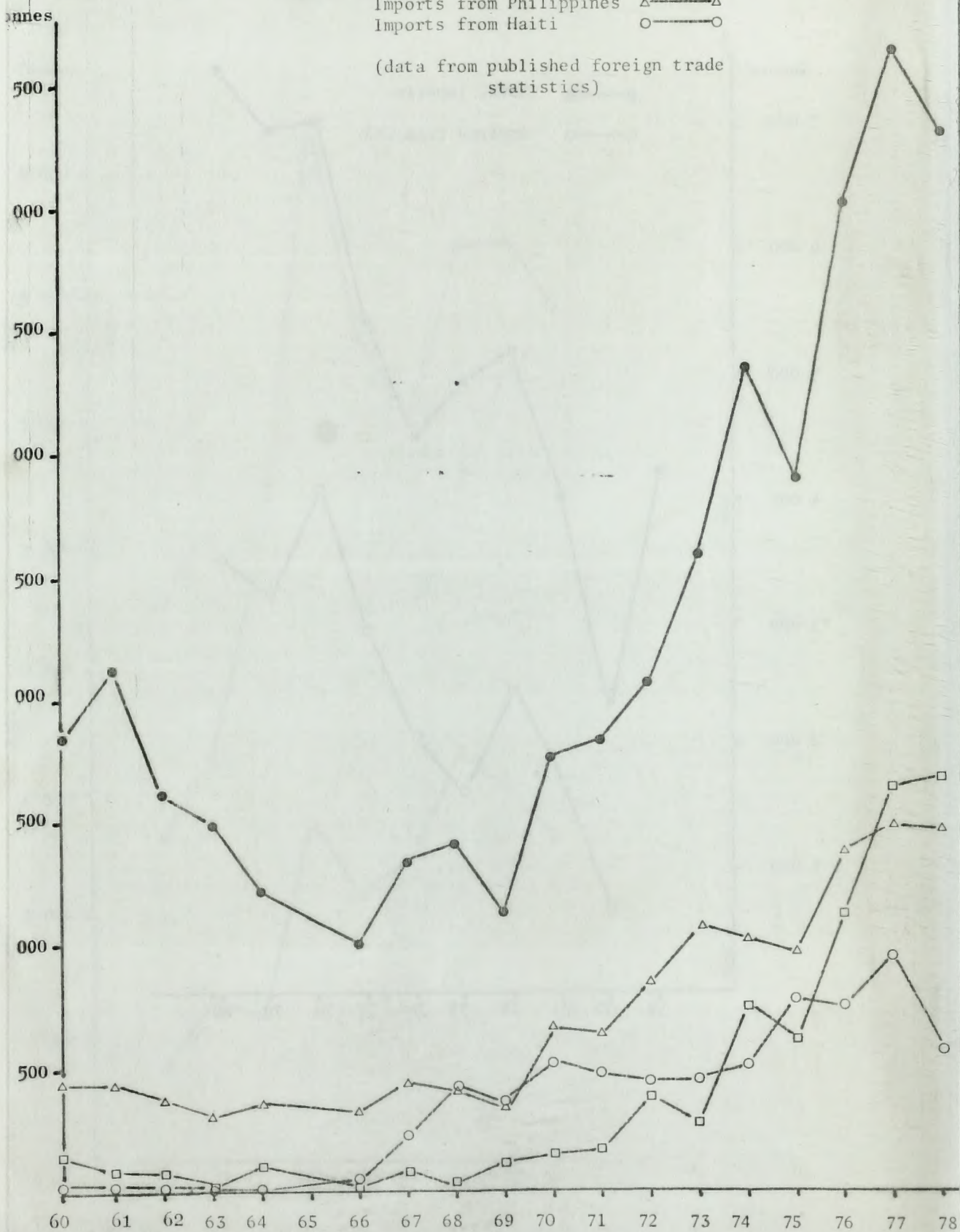


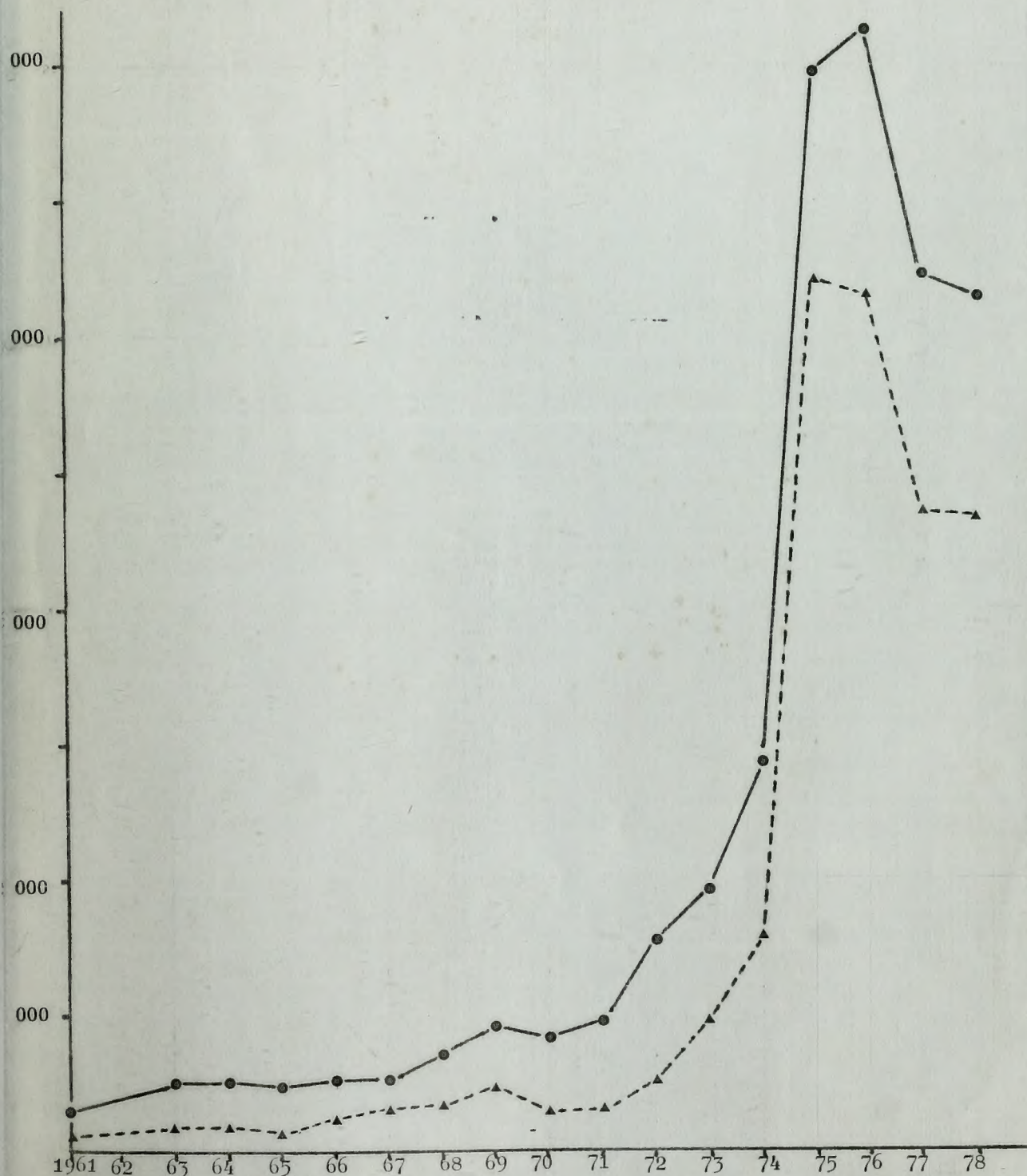


Fig 5

US Imports of Articles of Shell 1961-1978

\$ 1 000

● — ● Total imports  
▲ - - - ▲ Imports from Philippines





REPORT OF RESULTS OF 20-TH ANNUAL

